

Sensors for Factory Automation

Need some help with your sensing application? Contact the sensing experts at Ramco today!
Email us at nsales@ramcoi.com

- Displacement Laser
- Background Suppression - LED & Laser
- TOF Distance Sensing
- Transparent Object Detection
- Gen Purpose Photoelectric - LED & Laser
- Color/Mark Detection
- Fiber Optic Sensing
- Non-Contact Temperature Sensing



OPTEX FA CO., LTD.



Ultra High-Accuracy Laser Displacement Sensors

CDX Series

- Web server
- Ethernet
- Analog (option)

Model	Repeat Accuracy	Linearity ^{*1}	Measurement Range ^{*1}	Reflection Mode
CDX-L15A CDX-LW15A	0.25 µm	±0.05% of F.S. ^{*2}	15±1 mm ^{*2}	Specular
CDX-30A CDX-W30A	0.25 µm	±0.03% of F.S. ±0.015% of F.S.	30±5 mm	Specular Diffuse
CDX-85A CDX-W85A	0.25 µm	±0.018% of F.S. (65 to 85 mm) ±0.03% of F.S. (85 to 105 mm) ±0.015% of F.S.	85±20 mm	Specular Diffuse
CDX-150A CDX-W150A	0.25 µm	±0.03% of F.S. (110 to 150 mm) ±0.04% of F.S. (150 to 190 mm) ±0.015% of F.S.	150±40 mm	Diffuse

*1: Value of diffuse installation *2: Value of specular installation



High-Speed and High-Accuracy, All-in-one Sensors

CD2H Series

- OLED display
- Control output
- Analog
- RS-485
- IO-Link

Model	Repeat Accuracy	Linearity	Measurement Range	Laser Class
CD2H-30□A	0.25 µm	±0.1% of F.S.	30±5 mm	Class 1
CD2H-50□A	0.25 µm	±0.1% of F.S.	50±10 mm	Class 1
CD2H-130□	4 µm	±0.1% of F.S.	130±70 mm	Class 1
CD2H-245□	10 µm	±0.1% of F.S.	245±175 mm	Class 2
CD2H-350□	20 µm	±0.1% of F.S.	350±250 mm	Class 2
CD2H-700□	100 µm	±0.1% of F.S. (200 to 700 mm) ±0.3% of F.S. (700 to 1200 mm)	700±500 mm	Class 2



Compact amplifier built-in sensors

CD22 Series

- Aluminum/SUS housing
- Control output
- Analog
- RS-485



Small-sized, amplifier built-in sensors for wide range of measurement distances

CD33 Series

- Specular/Diffuse
- Control output
- Analog
- RS-422



Through-beam edge sensors

TD1 Series

- 10 mm measurement width
- Compact design
- RS-485



2-dimensional laser sensors

LS Series

- 3 control outputs
- Analog
- RS-485



Displacement sensor amplifier unit

CDA Series

- CDX/CD22/TD1 displacement sensors
- Data calculation • Analog
- Output control



IO-Link gateway

UC2-IOL

- Max. 16 devices • D4RF/D3WF sensors
- CDA amplifier • IO-Link



Field network communication unit

UC1-EC EtherCAT UC1-EP EtherNet/IP

- Max. 16 devices • D4RF/D3WF sensors • CDA amplifier



High-Power LED and IO-Link Supported BGS Sensors

Z4B Series

- Control output
- IO-Link

Sensing Distance

Z4B-S08□	80 mm
Z4B-10□	100 mm
Z4B-30□	300 mm



Time-of-Flight Sensors

TOF-DL Series

- Display
- Analog
- 3 control outputs
- IO-Link

Sensing Distance

TOF-DL	2.5 m
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TOF-L	4.5 m
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TOF-3V Diffuse Reflective	3.0 m
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TOF-3V Retro Reflective	20 m
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TOF-L Series



TOF-3V Series



High-accuracy C-MOS BGS Sensors

BGS-HDL Series

- 0.08 mm height gap
- 2 control outputs

Sensing Distance

BGS-HL□05□ BGS-HDL05T□	50 mm
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BGS-HL□25T□ BGS-HDL25T□	250 mm
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BGS-HL Series

- 0.08 mm height gap
- 1 control output

BGS-HLM Series

- 0.08 mm height gap
- SUS housing
- 1 control output

Industry-standard Laser BGS Sensors

BGS-ZL Series

- Small spot size $\Phi 1$ mm at 100 mm

Sensing Distance

BGS-ZL10□ BGS-Z10□ BGS-ZM10□	100 mm
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BGS-ZL30□ BGS-Z30□ BGS-ZM30□	300 mm
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BGS-Z Series



BGS-ZM Series

- SUS housing

IP67g



Small-sized BGS sensors

BGS-S Series

- W10 x D17.4 x H28 mm
- Sensing distance up to 80 mm



Universal voltage BGS sensors

BGS-2V Series

- VAC/VDC
- Sensing distance up to 1 m
- Relay output



M18 cylindrical sensors

BGS-C2 Series

- Metal housing
- Plastic housing



IO-Link Supported LED Sensors

Z4 Series

- Response time: 500 μ s or less (Through-beam)
- IO-Link

* Z-M Series: Stainless steel housing (IP67g)

Sensing Distance

Diffuse Reflective	1 m
Retro Reflective	4 m
Through-beam	25 m



Industry Standard Sized Laser Sensors

Z-L Series

- Response time: 250 μ s or less

Sensing Distance

Diffuse Reflective	400 mm
Retro Reflective	10 m
Through-beam	30 m



M18 Cylindrical Metal and Plastic Housing Sensors

C-R Series C2 Series

- Light source: red/infrared LED

Sensing Distance

Diffuse Reflective	400 mm
Retro Reflective	4 m
Through-beam	25 m

Amplifier-separate Laser Sensors



DS Series

- 1 or 2 control output
- Analog
- Max. 8 units connection

Sensing Distance

Coaxial	1 m
Diffuse Reflective	
Through-beam	2 m
Through-beam Length Measurement	2 m
Coaxial Retro-Reflective	50 m

Miniature Sensors



E Series

- Flat-on/Side-on

Sensing Distance

Diffuse Reflective	100 mm	Flat-on
Through-beam	500 mm	
Diffuse Reflective	30 mm	Side-on
Through-beam	500 mm	

Universal Power-input Sensors with Choices of Outputs and Connections



V3/V4 Series

- VAC/VDC
- Relay output
- Terminal block

Sensing Distance

Diffuse Reflective	2 m
Retro Reflective	12 m
Through-beam	70 m



High-Power Laser Sensors with Flexible Detection Settings

DR-Q Series

- Coaxial reflection
- Digital teach
- Built in ASC function

Sensing Distance

DR-Q150□	1.5 m
DR-Q400□	4 m



SUS protector sensors

KR-Q Series

- Sensing distance: up to 2.5 m



Small-sized sensors

SR-Q Series

- W10 x D17.4 x H28 mm
- Sensing distance: up to 300 mm



Standard-sized transparent-object detection sensors

Z3R-Q/ZR-QX Series

- Coaxial reflection (ZR-QX)
- Sensing distance: up to 2 m



RGB LED color mark sensors

DM Series

- Digital teach
- Color/Mark mode
- 8 presets
- 18±2 mm

16-channel Multifunctional IO-Link Master

Spring Clamp Type



IO-Link

UR-ES16DT

EtherNet/IP

EtherCAT

Modbus TCP

CC-Link IE Field Basic

PROFINET *
{JSON}

UR-MS16DT

CC-Link IETSN

CC-Link IE Field

- High-speed Counter
- Source, Sink DI/O

e-CON Type



IO-Link

UR-EE16DT

EtherNet/IP

EtherCAT

Modbus TCP

CC-Link IE Field Basic

PROFINET *
{JSON}

UR-ME16DT

CC-Link IETSN

CC-Link IE Field

- High-speed Counter
- Source, Sink DI/O

Compact IO-Link Hub

Spring Clamp Type



UR-DS16D

UR-DS16D

: 16 x DI

UR-DS16T

: 16 x DO

UR-DS8D8T

: 8 x DI, 8 x DO

UR-DS4AD

: 4 x AI

UR-DS4DA

: 4 x AO

UR-DS8RTD

: 8 x RTD Input *

UR-DS16TC

: 16 x Thermocouple Input *

UR-DS4TC

: 4 x Thermocouple Input *

Fiber-Optic Sensors



Fiber-Optic Sensors with IO-Link

D4RF/D4IF Series

- High accuracy model
- Analog
- OLED display
- Max. 16 units connection
- Red/infrared LED
- IO-Link
- 2 control outputs and 1 input
- 16 μ s response time



Digital Color Mark Sensors with White LED

D3WF Series

- Max. 16 units connection
- Ethernet IP via UC1
- IO-Link communication via UC2



Easy Teach with Sensitivity Indicator

V2RF Series

- Response time: 250 μ s



Basic Potentiometer Models

BRF Series

- Response time: 50 μ s/250 μ s

IP66

Fiber-Optic Cables



Flat/Square



Thread



Cylindrical



Flexible
(R1 mm, R2 mm)



Wide beam
(Screen)



Sleeve: Side-view



Bending resistant
(R4 mm)



Retro-reflective



Limited diffuse
reflective



Heat resistant



Chemical resistant



Liquid & water
detection



Lens attachment
detection

Stationary


**High-Speed & High-Accuracy
Non-Contact Thermometer**
TI-S Series

- Control output
- IO-Link
- Ring laser pointer
- Analog
- Accuracy $\pm 1^{\circ}\text{C}$
- Low temperature drift $\pm 0.2^{\circ}\text{C}/^{\circ}\text{C}$ or less

Sensor head **IP67**
Measurement Range

-40°C	500°C
-40°F	932°F

Ring laser pointer

**M18 cylindrical
models**
SA-80 Series

- Analog
- IO-Link

IP67
**Compact sensor
head models**
CS Series

- 2 control outputs
- Analog

IP69K
**Separate
models**
BS Series

- Analog
- Several options for sensor head

IP67
Measurement Range

0°C	200°C
32°F	392°F
0°C	400°C
32°F	752°F

Measurement Range

-40°C	500°C
-40°F	932°F
0°C	1000°C
32°F	1832°F

Measurement Range

0°C	500°C
32°F	932°F

Portable

Waterproof and shock resistant

PT-5LD/7LD
Measurement Range

0°C	500°C
32°F	932°F
-30°C	200°C
-22°F	392°F

PT-5LD

PT-7LD



Long range with narrow FOV

PT-S80/U80

- PT-U80 : USB I/F & data memory

Measurement Range

-30°C	600°C
-22°F	1112°F



All-in-one Vision Sensors with Camera, Lighting, Monitor and Controller

CVS Series

 CVSE1 : Easy Setup Color Matching
 CVS4 : Optical Character Recognition

- Multiple viewing areas
- W42 x D33.8 x H95 mm
- NPN/PNP
- External lighting & monitor

IP67

Multiple-camera Vision Sensors with a Separate Controller

MVS Series

MVS-OCR2 : Optical Character Recognition

- Max. 3 cameras
- 4.3" display
- USB
- NPN/PNP
- Ethernet
- Lighting control



Global Sales Network



FASTUS

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