RAMCO INNOVATIONS

CD33 series

CMOS sensor with ±0.1% F.S. linearity packed in a half-palm size.

- Compact design ideal for built-in use with OEM machines.
- Analogue output (4-20mA or 0-10V) + 2 control outputs
- Stand-alone design capable of direct operation without controller

Actual size

RAMCO INNOVATIONS

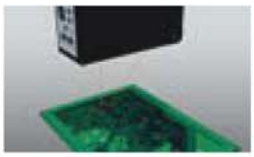
LINEUP

CD33-30NV (PV)
CD33-30NA (PA)

30mm distance type

Warping / Sagging of PC board

Measurement range : 30 ±4mm
Resolution : 4μm (Fast mode)
Linearity : ±0.1% F.S.



CD33-50NV (PV)
CD33-50NA (PA)

50mm distance type

Height of components on the board

Measurement range : 50 ±10mm
Resolution : 8μm (Fast mode)
Linearity : ±0.1% F.S.

CD33-85NV (PV)
CD33-85NA (PA)

85mm distance type

Joint of rubber sheet

Measurement range : 85 ±20mm
Resolution : 15μm (Fast mode)
Linearity : ±0.1% F.S.

CD33-120NV (PV)
CD33-120NA (PA)

120mm distance type

Loosen rubber sheet

Measurement range : 120 ±60mm
Resolution : 45μm (Fast mode)
Linearity : ±0.1% F.S.

Product code

- CD33-□□**NV** (N=NPN, V=0-10V)
- CD33-□□**PV** (P=PNP, V=0-10V)
- CD33-□□**NA** (N=NPN, A=4-20mA)
- CD33-□□**PA** (P=PNP, A=4-20mA)

RAMCO INNOVATIONS

CD33 ADVANCED TECHNOLOGY

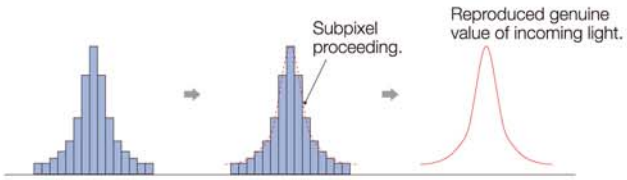
The CD33 series is a function rich CMOS laser displacement sensor designed in an ultra-compact housing

Just 65g weight.

Stand-alone design dedicates space-saving as well as cost-saving.
No separate controller required and thanks to the light weight, the CD33 is ideal for installations on robot end e ectors.

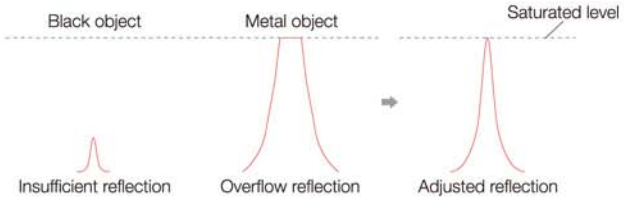
Digital subpixel processing

Subpixel processing divides one pixel into small pieces that enables accurate measurement by reproducing genuine value of incoming light.



High resolution electronic shutter

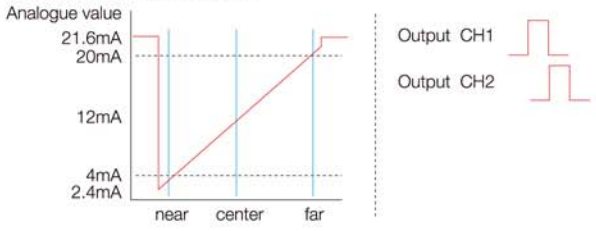
High resolution electronic shutter controls to keeps a constant level according to reflection.
This function enables stable peak level detection even when unstable surface conditions exist.



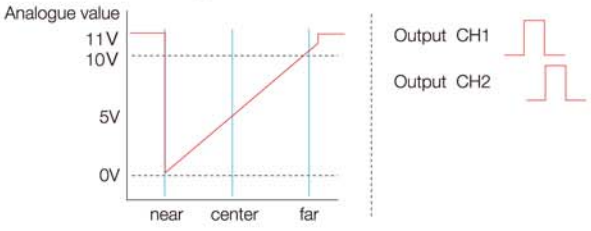
Easy-to-select models between voltage and current output.

It is common today for sensors to be very complicated requiring long set-up times and many buttons to operate.
The CD33 focuses on easier set-up by separating voltage and current output models into two types.

4-20mA output + 2CH outputs



0-10V output + 2CH outputs



DIMENSIONS

Ideal for robot mounting

Ideal for mounting on robot cylinder thanks to compact dimensions and the light 65g weight. IP67 water tightness is also secured.

Easy operation

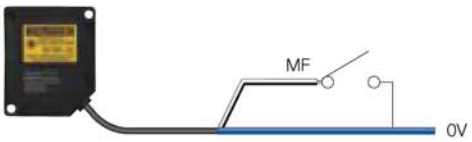
Just two buttons (SET and SELECT) are enough to set and operate. LED indicator shows which function you are setting.

2CH outputs enables individual setting of measurement range.

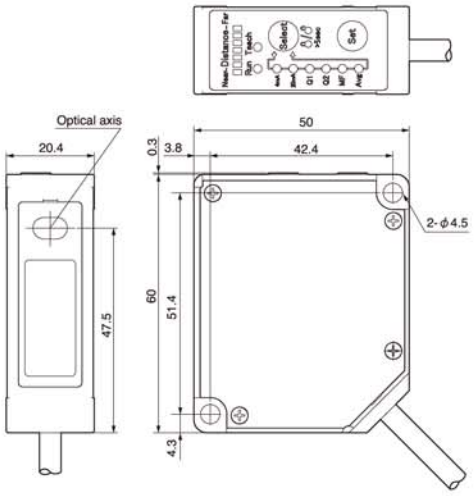
Highly accurate comparator output capable of identifying 12μm (with CD33-30 types). Hysteresis is just 0.15% F.S.

MF (Multi Function) input for further convenience.

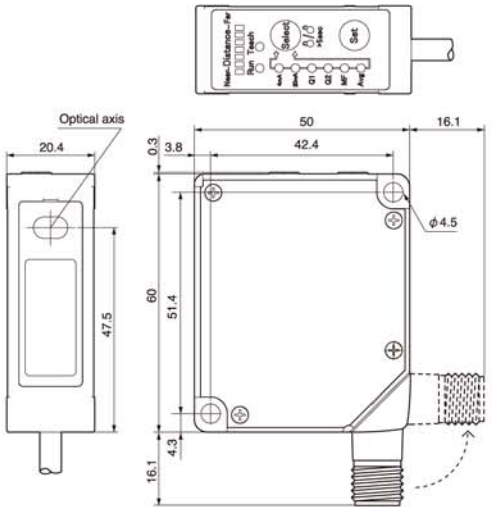
The programmable remote MF input can be set to one of the following: Laser o , External teach, Hold, or One-shot trigger.



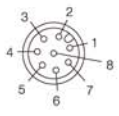
Cable type



M12 Connector type



Connector pinout



(mm)

RAMCO INNOVATIONS

SPECIFICATIONS

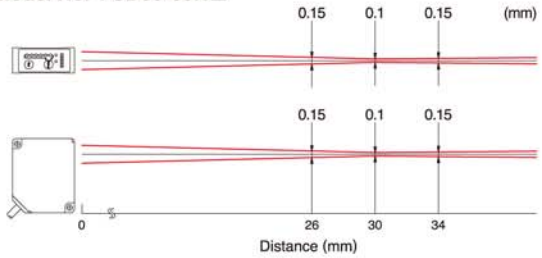
Model	Cable type	2control output	CD33-30N / P	CD33-50N / P	CD33-85N / P	CD33-120N / P
		2control output + Analog 4-20mA	CD33-30NA / PA	CD33-50NA / PA	CD33-85NA / PA	CD33-120NA / PA
		2control output + Analog 0-10V	CD33-30NV / PV	CD33-50NV / PV	CD33-85NV / PV	CD33-120NV / PV
		1control output + RS422	CD33-30N-422 / P-422	CD33-50N-422 / P-422	CD33-85N-422 / P-422	CD33-120N-422 / P-422
	Connector type	2control output	CD33-30CN / CP	CD33-50CN / CP	CD33-85CN / CP	CD33-120CN / CP
		2control output + Analog 4-20mA	CD33-30CNA / CPA	CD33-50CNA / CPA	CD33-85CNA / CPA	CD33-120CNA / CPA
		2control output + Analog 0-10V	CD33-30CNV / CPV	CD33-50CNV / CPV	CD33-85CNV / CPV	CD33-120CNV / CPV
		1control output + RS422	CD33-30CN-422 / CP-422	CD33-50CN-422 / CP-422	CD33-85CN-422 / CP-422	CD33-120CN-422 / CP-422
Control output			N = NPN output, P = PNP output			
Measurement range			30±4mm	50±10mm	85±20mm	120±60mm
Full scale			8mm	20mm	40mm	120mm
Light source			Red laser diode (wave length 650nm)			
Peak power			1mW max.			
IEC/JIS Class			Class 2			
FDA CLASS			CLASS II			
Spot size (approx.volume) (*1)		**Near**	0.15×0.15mm	0.6×1.2mm	0.9×1.5mm	1.2×1.8mm
		Middle	0.1×0.1mm	0.5×1.0mm	0.75×1.25mm	1.0×1.5mm
		Far	0.15×0.15mm	0.4×0.9mm	0.6×1.0mm	0.5×0.8mm
Linearity (*2)			±0.1% F.S.			
Resolution (*3)		**Fast**	4μm	8μm	15μm	45μm
		Other	2μm	5μm	10μm	30μm
Supply voltage			12 - 24V DC (–5 to +10%)			
Temp drift			±0.08%F.S. / ℃			
Response time (*4)		**Fast**	1ms+ selecting sensitivity (averaging: 1)			
		Standard	8.5ms+ selecting sensitivity (averaging: 16)			
		High resolution	32.5ms+ selecting sensitivity (averaging: 64)			
		Selecting sensitivity	4ms max.			
Indicators		**Distance indicator**	bar graph LED			
		Output indicator	ON status : Orange			
Protection category			IP67			
Operating temp / humidity			−10～+45℃ / 35～85%RH (No condensation or freezing)			
Storage temp / humidity			−20～+60℃ / 35～95%RH (No condensation or freezing)			
Ambient illuminance			Sun light: 10,000lx max. Incandescent lamp: 3,000lx max.			
Vibration resistance			10 to 55 Hz, Double amplitude 1.5 mm, 2 h for XYZ axes			
Shock resistance			50G (500m/s²)			
Material			PBT (Case) PMMA (Front window)			
Weight		**Cable type**	approx.65g (without cable)			
		Connector type	approx.70g			

Model		2 Control output	+ Analog 4-20mA	+ Analog 0-10V	2 Control output + RS422
Supply voltage		DC 12-24V (-5%, +10%)		DC 18-24V (-5%, +10%)	DC 12-24V (-5%, +10%)
Current consumption		max. 75mA (DC24V)	max. 80mA (DC24V) including analog output		max. 75mA (DC24V)
Output	**Control output 1**	NPN / PNP open collector 100mA max. / 30VDC (residual voltage max. 1.8V)			—
	Control output 2	NPN / PNP open collector 100mA max. / 30VDC (residual voltage max. 1.8V)			
	Analog output	—	4-20mA	0-10V	—
Interface		—			RS422
Cable type		Dia : 5mm 5core 2m AWG24 (PVC)	Dia : 5mm 6core 2m AWG24 (PVC)		Dia : 5mm 8core 2m AWG24 (PVC)
Connector type		M12 8pin			

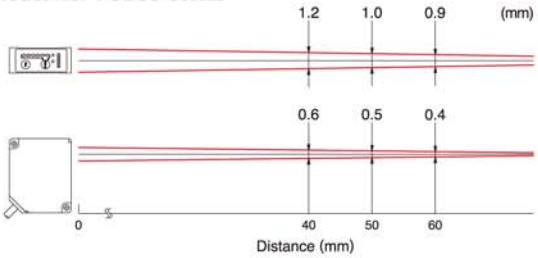
*1 Defined with center strength 1/e² (13.5%). There may be leak light other than the specified spot size. The sensor may be affected when there is a highly reflective object around the targets.
*2 Averaging: 64 (High resolution), Object: white ceramic.
*3 Middle of measuring range, Object: white ceramic.
*4 Response time : response time plus selecting sensitivity time.

SPOT SIZE

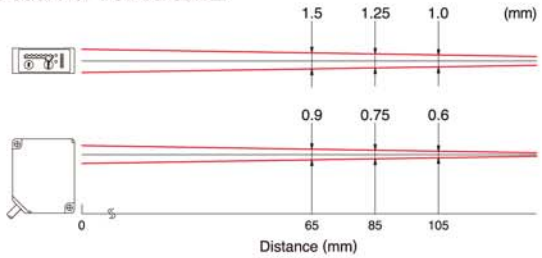
Model No. : CD33-30N□



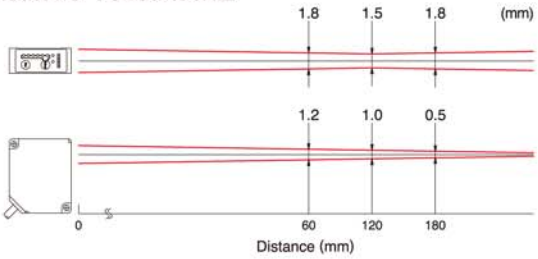
Model No. : CD33-50N□



Model No. : CD33-85N□

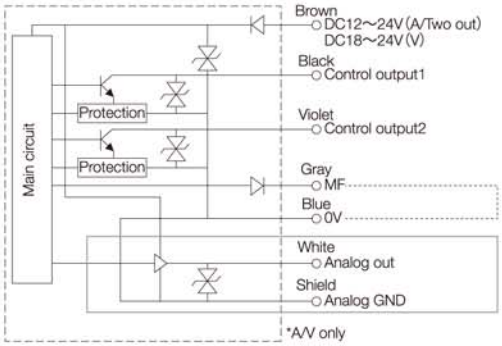


Model No. : CD33-120N□

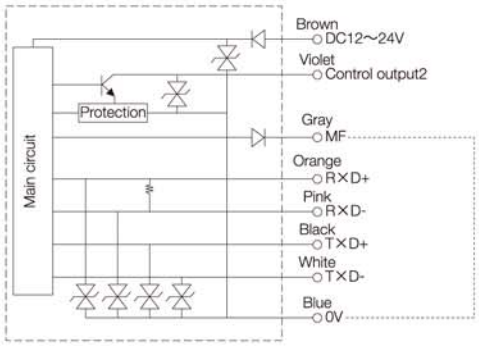


INPUT / OUTPUT DIAGRAMS

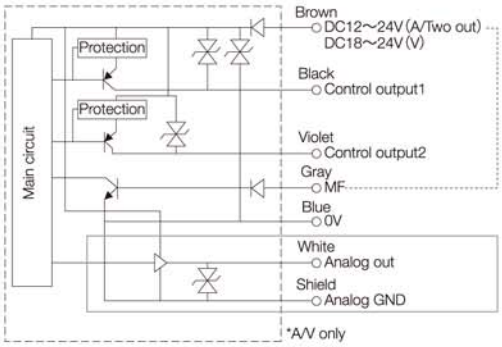
NPN type (Analogue/Voltage dual)



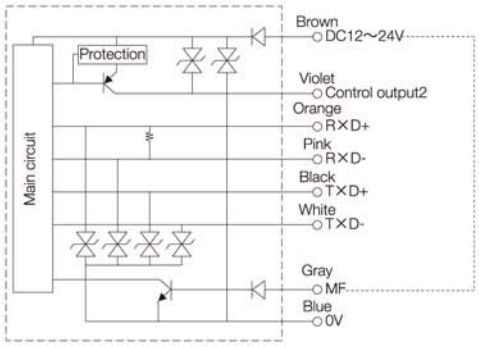
NPN type (RS422)



PNP type (Analogue/Voltage dual)



PNP type (RS422)



Cost effective
Standalone displacement sensor

Laser displacement sensor

CD33-250

FOR QUESTIONS AND ORDER INFORMATON PLEASE CALL:

(800) 280-6933

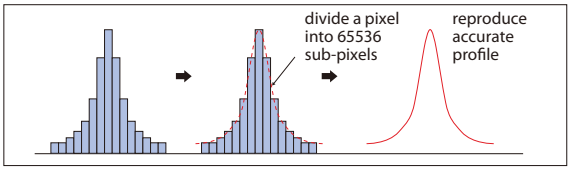
www.Optex-Ramco.com

250±150 mm

Digital sub-pixel processing

Accurate profile reproduction

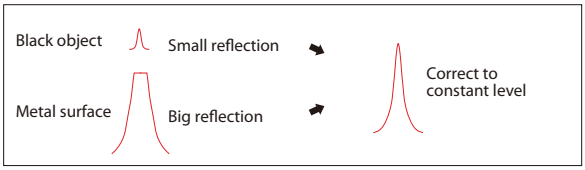
The linearity has been improved by digital sub-pixel processing. Repeatability is also improved to 75um.



High resolution electronic shutter

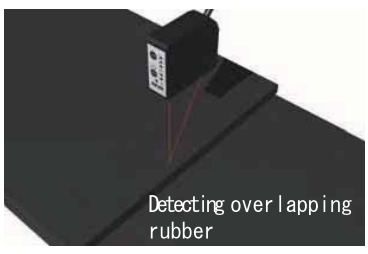
Automatic level correction

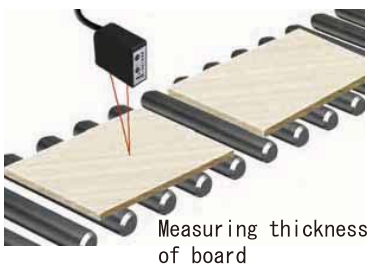
A high resolution electronic shutter helps to insure stable peak level detection even when unstable surface conditions exist.



Application

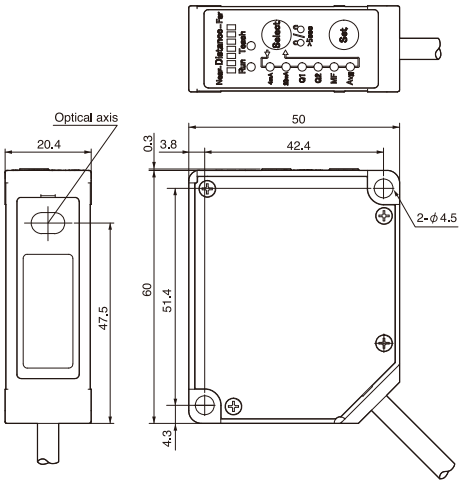
Ramco Innovations
(800) 280-6933
www.Optex-Ramco.com



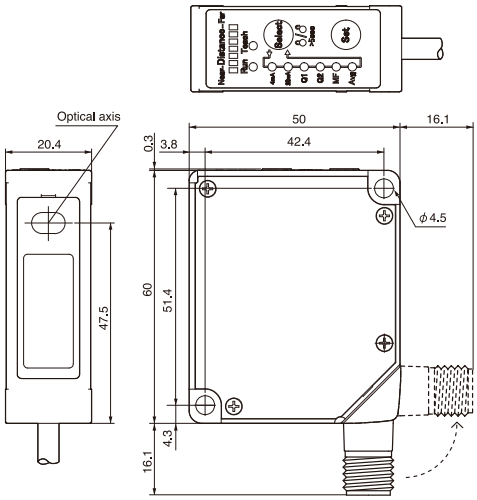


DIMENSIONS

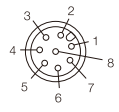
Cable type



M12 Connector type



Connector pinout



(mm)

SPECIFICATIONS

Model	Cable type	2control output	CD33-250N / P
		2control output + Analog 4-20mA	CD33-250NA / PA
		2control output + Analog 0-10V	CD33-250NV / PV
		1control output + RS422	CD33-250N-422 / P-422
	Connector type	2control output	CD33-250CN / CP
		2control output + Analog 4-20mA	CD33-250CNA / CPA
		2control output + Analog 0-10V	CD33-250CNV / CPV
		1control output + RS422	CD33- 250CN-422 / CP-422
Control output			N = NPN output, P = PNP output
Measurement range			250± 150mm
Full scale			300mm
Light source			Red laser diode (wave length 650nm)
Peak power			1mW max.
IEC/JIS Class			Class 2
FDA CLASS			CLASS II
Spot size (approx.volume) (*1)		Near	1.5 × 2.5mm at 100mm
		Middle	1.75 × 3.5mm at 250mm
		Far	2.0 × 4.5mm at 400mm
Linearity (*2)			±0.3% F.S. (300mm)
Resolution (*3)		Fast	100μm
		Other	75μm
Supply voltage			12 - 24V DC (–5 to +10%)
Temp drift			±0.08%F.S. / ˚C
Response time (*4)		Fast	1.5 ms+ selecting sensitivity (averaging : 1)
		Standard	13 ms+ selecting sensitivity (averaging : 16)
		High resolution	49 ms+ selecting sensitivity (averaging : 64)
		Selecting sensitivity	6ms max.
Indicators		Distance indicator	bar graph LED
		Output indicator	ON status : Orange
Protection category			IP67
Operating temp / humidity			−10～+45˚C / 35～85%RH (No condensation or freezing)
Storage temp / humidity			−20～+60˚C / 35～95%RH (No condensation or freezing)
Ambient illuminance			Sun light : 10,000lx max. Incandescent lamp : 3,000lx max.
Vibration resistance			10 to 55 Hz, Double amplitude 1.5 mm, 2 h for XYZ axes
Shock resistance			50G (500m/s²)
Material			PBT (Case) PMMA (Front window)
Weight		Cable type	approx.65g (without cable)
		Connector type	approx.70g

Model		2 Control output	+ Analog 4-20mA	+ Analog 0-10V	2 Control output + RS422
Supply voltage		DC 12-24V (-5%, +10%)		DC 18-24V (-5%, +10%)	DC 12-24V (-5%, +10%)
Current consumption		max. 55mA (DC24V)	max. 85mA including analog output	max. 55mA (DC24V)	
Output	Control output 1	NPN / PNP open collector 100mA max. / 30VDC (residual voltage max. 1.8V)			—
	Control output 2	NPN / PNP open collector 100mA max. / 30VDC (residual voltage max. 1.8V)			
	Analog output	—	4-20mA	0-10V	—
Interface		—			RS422
Cable type		Dia : 5mm 5core 2m AWG24 (PVC)	Dia : 5mm 6core 2m AWG24 (PVC)		Dia : 5mm 8core 2m AWG24 (PVC)
Connector type		M12 8pin			

*1 Defined with center strength $1/e^2$ (13.5%). There may be leak light other than the specified spot size. The sensor may be affected when there is a highly reflective object around the targets.
*2 Averaging : 64 (High resolution), Object : white ceramic.
*3 Middle of measuring range, Object : white ceramic.
*4 Response time : response time plus selecting sensitivity time.