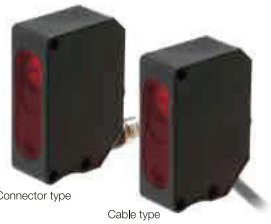
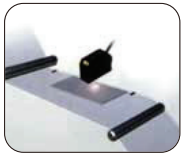
Photoelectric Sensor

DM-18T series



- DM-18T series, RGB sensor with automatic LED selection control.
- Numerical display for easy setting

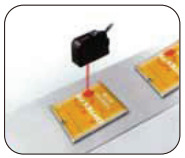
Applications



Registration mark on transparent film

Synchronizing sensor for vision sensor CVS

Color mark on laminate tube

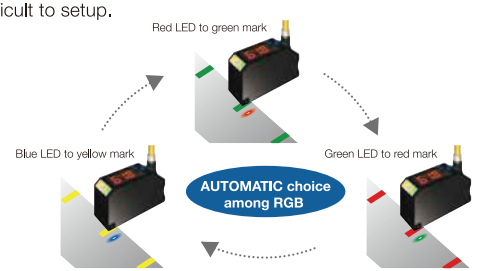


Mark on multicolored print

Two modes of operation are available, Mark Detection Mode and RGB Color Detection Mode.
The sensor can store up to 8 complete sets of parameters to reduce the setup time when changing products.

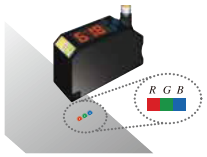
Automatic Choice of RGB light source - Mark Detection mode

The DM-18T has a Red, Green and Blue LED light source built-in, the microcomputer will select the proper one to use according to the specific target color. When initially setting the sensor there is no need to perform this step.
The sensor monitors the contrast between the background and target, it is capable of sensing the difference between colors that used to be difficult to setup.



Color Mode

To select a specific color, a three color (RGB) LED element is used. The sensor computes the color ratio between the three colors. The accuracy of the color detection is assured even with products moving on a conveyor.
One sensor is able to operate in two modes, Mark Detection (Mark Mode) or Color Sensing (Color Mode)



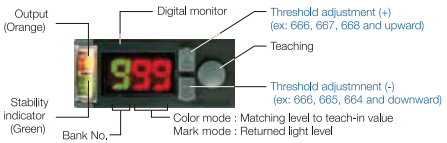
Store up to 8 sets of parameters Color/Mark Sensor

The DM-18T is able to store 8 complete sets of parameters (banks) for quick product changeover. The desired bank can be selected remotely via the three remote inputs.

Bank No.	Wire color		
	Green	Rose	Yellow
1	0	0	0
2	0	0	1
3	0	1	0
4	0	1	1
5	1	0	0
6	1	0	1
7	1	1	0
8	1	1	1

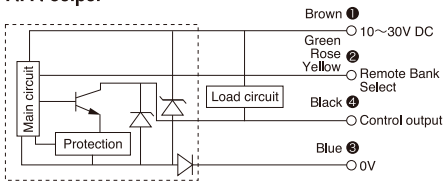
Remarks : 0 = Connect to +V, or leave open
1 = Connect to 0V

Pushbutton Teach with Fine Adjustment

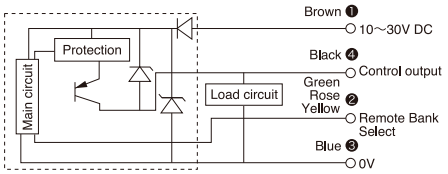


Circuit diagram

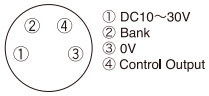
NPN output



PNP output

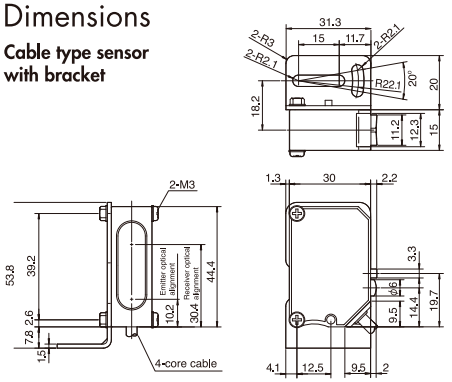


4 Pin configuration

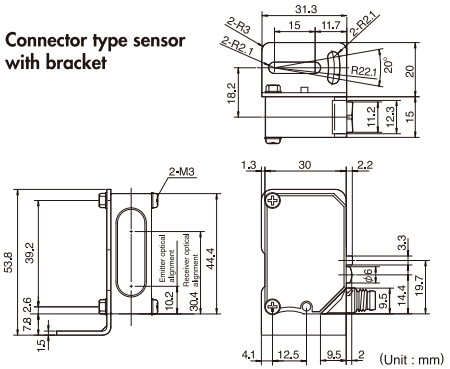


Dimensions

Cable type sensor with bracket



Connector type sensor with bracket



(Unit : mm)

Color response (Color Mode)

Mode : Color mode

:Excellent :Good enough :Good :Impossible

teach color \ measured color	33N (purple)				43N (blue)				47N (light blue)				54N (green)				4N (yellow)				8N (orange)				23N (red)				77N (brown)				88N (black)			
	100	75	50	25	100	75	50	25	100	75	50	25	100	75	50	25	100	75	50	25	100	75	50	25	100	75	50	25	100	75	50	25	100	75	50	25
33N (purple) 100		88	63	34	0	0	0	2	0	0	0	0	0	0	0	3	30	32	38	31	59	57	57	42	67	69	67	47	55	54	38	21	60	58	42	23
33N (purple) 75	90		74	44	1	0	2	12	0	0	0	0	0	0	1	12	32	33	40	41	60	58	58	54	58	66	69	56	56	57	47	32	61	60	54	32
33N (purple) 50	66	77		68	26	21	27	36	0	0	0	22	1	8	21	36	43	45	51	61	45	54	70	71	34	42	76	76	69	68	68	54	75	72	71	54
33N (purple) 25	37	46	70		40	51	55	66	0	0	10	50	22	38	52	66	51	60	65	75	15	25	54	85	4	12	47	88	59	74	84	84	55	67	86	84
43N (blue) 100	0	0	0	0		90	61	18	43	47	51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43N (blue) 75	0	0	0	0	88		68	24	52	54	55	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43N (blue) 50	0	0	0	0	67	74		77	0	4	48	68	16	31	47	0	0	0	0	0	0	0	0	0	0	0	0	0	14	33	0	0	22	26	51	0
43N (blue) 25	1	10	34	63	40	49	76		0	1	42	85	37	53	69	80	15	26	44	67	0	0	18	54	0	0	10	52	23	37	61	76	18	32	57	77
47N (light blue) 100	0	0	0	0	47	51	56	28		88	60	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47N (light blue) 75	0	0	0	0	51	55	57	40	85		75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47N (light blue) 50	0	0	0	0	0	0	34	70	66	79		0	39	56	66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	6	30	0
47N (light blue) 25	0	1	24	55	31	42	67	89	0	9	50		45	61	76	86	5	17	35	57	0	0	9	45	0	0	1	43	10	28	51	68	12	20	52	62
54N (green) 100	0	0	0	0	0	0	0	14	36	42	41	34		83	66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	12	0
54N (green) 75	0	0	0	0	0	0	0	27	32	46	54	48	85		78	0	0	0	0	0	0	0	0	0	0	0	0	0	1	13	0	0	0	1	24	0
54N (green) 50	0	0	0	9	0	0	1	42	28	41	62	69	62	79		78	0	11	38	66	0	0	0	38	0	0	0	20	0	22	45	54	0	3	35	52
54N (green) 25	4	13	38	66	18	28	56	80	0	0	38	84	57	69	85		17	29	47	70	0	0	22	58	0	0	14	55	23	40	65	80	23	33	56	80
4N (yellow) 100	30	32	43	51	1	0	10	17	0	0	0	4	0	0	5	17		87	69	47	64	72	72	60	53	60	62	62	74	74	52	35	68	70	57	35
4N (yellow) 75	31	34	44	59	1	10	19	26	0	0	0	12	0	2	17	30	88		80	60	52	61	74	71	39	48	63	67	75	75	64	50	71	71	70	48
4N (yellow) 50	38	40	51	65	6	17	36	44	0	0	0	29	7	16	33	47	70	82		76	34	46	74	80	24	33	67	75	76	82	80	64	75	78	79	65
4N (yellow) 25	34	44	61	76	16	25	53	68	0	0	14	53	27	37	57	68	48	60	78		12	24	52	86	1	11	44	83	51	70	92	87	52	64	89	88
8N (orange) 100	58	61	43	14	0	0	0	0	0	0	0	0	0	0	0	0	62	51	32	12		86	58	23	87	88	66	25	59	40	15	1	60	47	22	1
8N (orange) 75	57	60	53	25	0	0	0	0	0	0	0	0	0	0	0	0	72	62	43	22	89		69	34	78	86	78	36	71	53	26	11	72	56	32	14
8N (orange) 50	57	60	69	54	10	4	12	21	0	0	0	5	0	0	6	22	72	74	74	51	60	70		63	47	57	88	68	96	80	56	42	91	85	61	41
8N (orange) 25	45	55	70	85	26	34	49	57	0	0	2	42	22	27	45	58	57	71	80	87	23	34	63		12	21	55	93	63	80	93	75	65	76	95	76
23N (red) 100	64	56	31	3	0	0	0	0	0	0	0	0	0	0	0	0	54	41	22	1	87	76	47	12		90	56	15	46	30	4	0	54	35	10	0
23N (red) 75	69	63	41	12	0	0	0	0	0	0	0	0	0	0	0	0	59	49	32	10	88	86	56	22	90		64	24	54	39	16	1	58	47	20	0
23N (red) 50	67	71	76	45	2	0	3	13	0	0	0	0	0	0	0	14	61	63	65	42	68	78	89	55	56	67		69	86	72	47	31	91	82	52	33
23N (red) 25	49	58	75	87	26	33	45	53	0	0	0	41	18	25	40	53	61	68	74	83	27	37	66	93	14	25	59		69	86	89	74	64	75	91	72
77N (brown) 100	0	0	0	0	1	1	11	19	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0		79	0	0	85	85	58	0
77N (brown) 75	0	0	0	0	15	16	31	0	0	0	0	27	1	9	26	0	0	0	0	0	0	0	0	0	0	0	0	0	81		0	0	90	94	74	0
77N (brown) 50	40	50	69	84	25	35	54	60	0	0	5	48	32	32	48	63	51	64	80	90	19	28	58	92	7	16	49	89	60	75		82	70	66	95	83
77N (brown) 25	25	34	57	85	23	35	62	78	0	0	20	63	42	50	64	80	38	48	66	88	3	12	42	76	0	0	34	74	44	60	84		52	50	80	97
88N (black) 100	0	0	0	0	10	13	24	35	0	0	0	0	1	9	21	0	0	0	0	0	0	0	0	0	0	0	0	0	85	91	0	0		92	71	0
88N (black) 75	0	0	0	0	11	8	21	32	0	0	0	0	0	5	15	0	0	0	0	0	0	0	0	0	0	0	0	0	89	92	0	0	80		69	0
88N (black) 50	0	0	0	0	25	32	48	0	0	0	0	0	24	30	44	0	0	0	0	0	0	0	0	0	0	0	0	0	70	85	0	0	87	77		0
88N (black) 25	26	35	57	86	25	35	63	78	0	0	20	64	45	52	64	78	37	46	68	88	3	13	43	77	0	1	34	75	41	58	84	97	56	53	78	

n < 80	
80<=n < 85	
85<=n < 90	

"SP"value = Response time	Hysteresis
H1 : 0.8ms	8
H2 : 1.6ms	6

Color response (Mark Mode)

Mode : Mark mode

:Excellent :Impossible

teach color \ measured color	33N (purple)				43N (blue)				47N (light blue)				54N (green)				4N (yellow)				8N (orange)				23N (red)				77N (brown)				88N (black)			
	100	75	50	25	100	75	50	25	100	75	50	25	100	75	50	25	100	75	50	25	100	75	50	25	100	75	50	25	100	75	50	25	100	75	50	25
33N (purple) 100																																				
33N (purple) 75	○																																			
33N (purple) 50	○	○																																		
33N (purple) 25	○	○	○																																	
43N (blue) 100	○	○	○	○																																
43N (blue) 75	○	○	○	○	×																															
43N (blue) 50	○	○	○	○	○	○																														
43N (blue) 25	○	○	○	○	○	○	○																													
47N (light blue) 100	○	○	○	○	○	○	○	○																												
47N (light blue) 75	○	○	○	○	○	○	○	○	×																											
47N (light blue) 50	○	○	○	○	○	○	○	○	○	○																										
47N (light blue) 25	○	○	○	○	○	○	○	○	○	○	○																									
54N (green) 100	○	○	○	○	○	○	○	○	○	○	○	○																								
54N (green) 75	○	○	○	○	○	○	○	○	○	○	○	○	×																							
54N (green) 50	○	○	○	○	○	○	○	○	○	○	○	○	○	○																						
54N (green) 25	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○																					
4N (yellow) 100	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○																				
4N (yellow) 75	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	×																			
4N (yellow) 50	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○																		
4N (yellow) 25	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○																	
8N (orange) 100	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○																
8N (orange) 75	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○															
8N (orange) 50	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○														
8N (orange) 25	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○													
23N (red) 100	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○												
23N (red) 75	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○											
23N (red) 50	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○										
23N (red) 25	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	×	○	○	○									
77N (brown) 100	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○								
77N (brown) 75	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○							
77N (brown) 50	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○						
77N (brown) 25	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○					
88N (black) 100	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○				
88N (black) 75	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	×			
88N (black) 50	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	×	○	○	○		
88N (black) 25	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	

Specifications

Model	Mark / RGB Color type
Cable type	DM-18TN (or 18TP)
M8 connector type	DM-18TCN (or 18TCP)
Sensing distance	18 +/- 2mm
Spot size	1 X 6 mm/18mm
Range adjustment	Teach-in
Supply voltage	DC10-30V including 10% ripple (P-P)
Current consumption	35mA (12V), 25mA (24V)
Response time	Mark mode : H1/250μs, H2/500μs, L/1200μs Color mode : H1/800μs, H2/1600μs, L/4000μs
Timer	Off delay/On delay/One shot delay (10msec increment : 0-990msec, 1sec increment for 1-10 sec)
Light source	RGB LED
LED Indicator	Output indicator (orange), Stable detection (green)
Digital indicator	7 segment, 3 digit Red and Green LED
Control output	NPN or PNP open collector DC30V 100mA max
Operation mode	Light/Dark On selectable
Operating temp / humidity	−25 to 55 °C / 35-95% RH
Insulation resistance	20M Ohm or more (at 500V DC)
Protection category	IP67
Noise resistance	IEC, CE
Shock resistance	50G (500m/S2) , XYZ 3 directions
Environmental illuminance	Sunlight : 10,000 lux, Incandescent lamp : 3,000 lux max
Material	Anti-bacterial ABS (housing), PMMA (lens)

Options

JCN-S : M8 Straight type

JCN-S : 2 meter
JCN-5S : 5 meter
JCN-10S : 10 meter

JCN-L : L-shape M8 type

JCN-L : 2 meter
JCN-5L : 5 meter
JCN-10L : 10 meter

Reference (typical)

DM-18T