

# Photoelectric Sensors

Optex FA is now the second largest supplier of photoelectric sensors in Japan.

Optex provides an extensive selection of sensors to solve most applications.

All sensors are available in Cabled or M8 QD versions and are offered with a choice of NPN or PNP outputs.

# RGB Sensor for color sensing

## DM-18T series

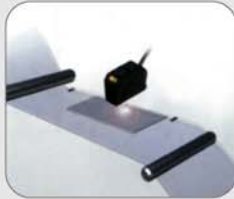


### DM-18T series

Mark / RGB color Type  
 (Sensing distance : 18±2mm)  
 · DM-18TN / TP / TCN / TCP

Photoelectric Sensor

### Applications



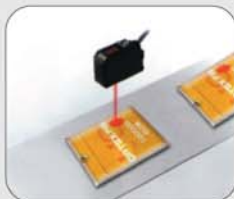
Registration mark on transparent film



Synchronizing sensor for vision sensor CVS



Color mark on laminate tube



Mark on multicolored print

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

Two modes of operation are available, Mark Detection Mode and RGB Color Detection Mode.

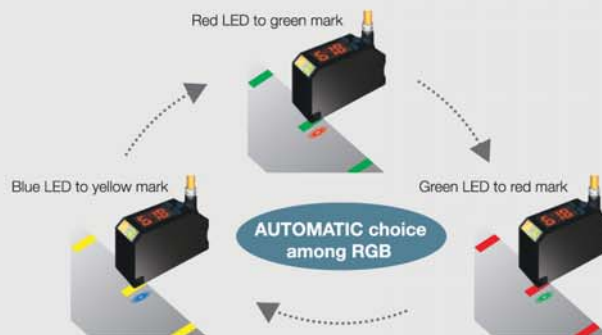
The sensor can store up to 8 complete sets of parameters to reduce the setup time when changing products.

### Features

#### 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)



C
E
J
J2
J3
V
V2
V3
V4
SR-Q
S
Z
BGS-Z
K
FGS-D
BGS-D
BGS-2S
Y
<b>DM-18T</b>
Accessory

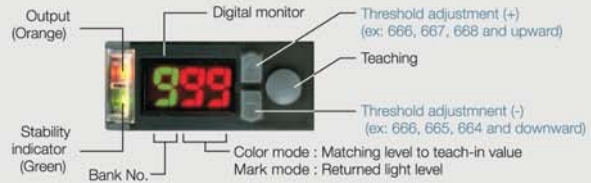
## Store up to 8 sets of parameters Color/Mark Sensor

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

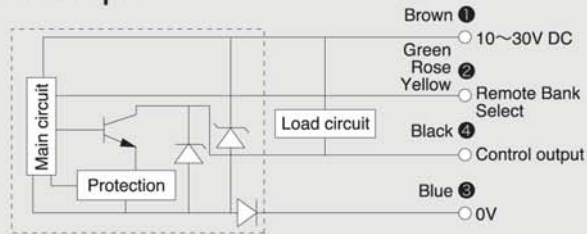
Remarks : 0 = Connect to +V, or leave open  
1 = Connect to 0V

## Pushbutton Teach with Fine Adjustment

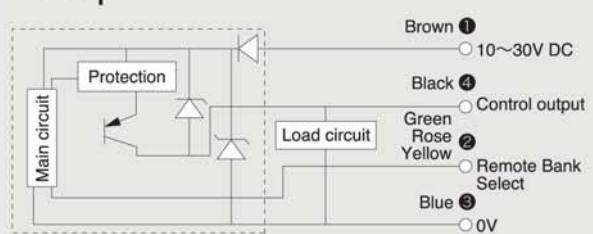


## Circuit diagram

### NPN output



### PNP output

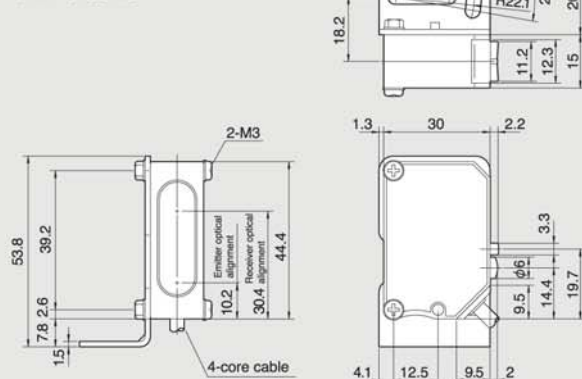


### 4 Pin configuration

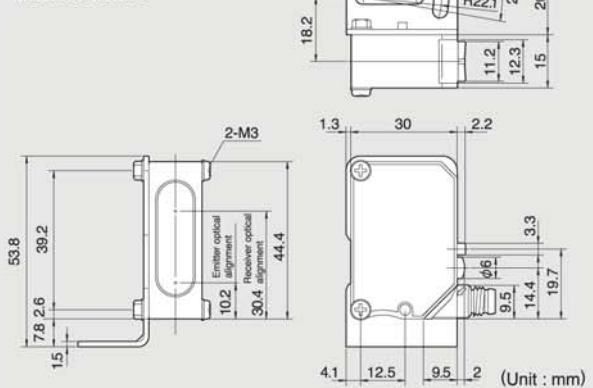


## Dimensions

### Cable type sensor with bracket



### Connector type sensor with bracket



- C
- E
- J
- J2
- J3
- V
- V2
- V3
- V4
- SR-Q
- S
- Z
- BGS-Z
- K

DM-18T

Accessory

## Color response (Color Mode)

Mode : Color mode

  :Excellent  
   :Good enough  
   :Good  
   :Impossible

		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	100	75	50	25			
teach color	33N (purple)	100	88	63	34	0	0	0	2	0	0	0	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				
	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								
	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								
	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	0	0					
	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	0	0	0	0				
	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	0	0	0	0	0	0	0	0	0	0	0	0	0			
	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	0	0	0	0			
	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	0	0	0	0	0	0		
	50	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	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	0	0	0	0	0	0	0	0	0	0	0	0	0	
	75	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	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								
	25	4	13	38	66	18	28	56	80	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	0	5	17	87	69	47	64	72	72	60	53	60	62	62	74	74	52	35	68	70	57	35						
	75	31	34	44	59	1	10	19	26	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									
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	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	0	62	51	32	12	86	58	23	87	88	66	25	59	40	15	1	60	47	22	1							
75	57	60	53	25	0	0	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							
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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	0	54	41	22	1	87	76	47	12	90	56	15	46	30	4	0	54	35	10	0							
75	69	63	41	12	0	0	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							
50	67	71	76	45	2	0	3	13	0	0	0	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						
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	11	19	0	0	0	0	0	0	8	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				
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	0	0	0	0	0	0	0	0	0	0	0	0	0			
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									
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	0	0	0	0	0	0	0	0	0	0	0	0			
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	0	0	0	0	0	0	0	0	0	0	0	0	0			
50	0	0	0	0	25	32	48	0	0	0	0	0	0	24	30	44	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	0		
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	"SP" value = Response time	Hysteresis
80 <= n < 85	H1 : 0.8ms	8
85 <= n < 90	H2 : 1.6ms	6
90 <= n	L : 4ms	4

Accessory



## Specifications

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

C

E

J

J2

J3

V

V2

V3

V4

SR-Q

S

Z

BGS-Z

K

FGS-D

BGS-D

BGS-2S

Y

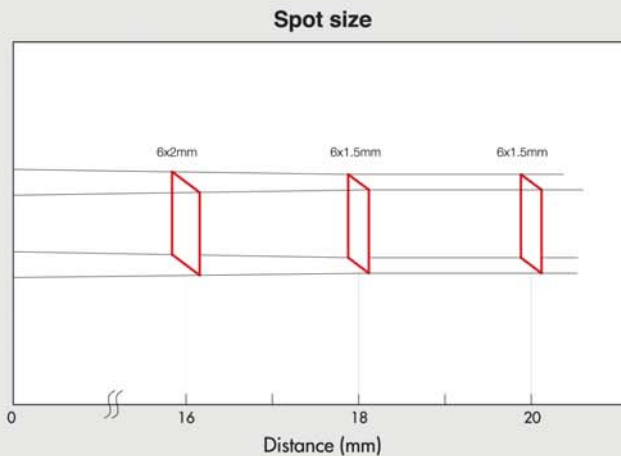
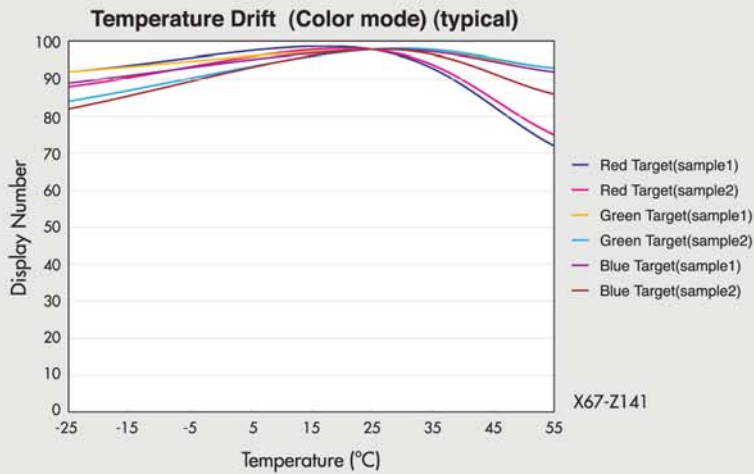
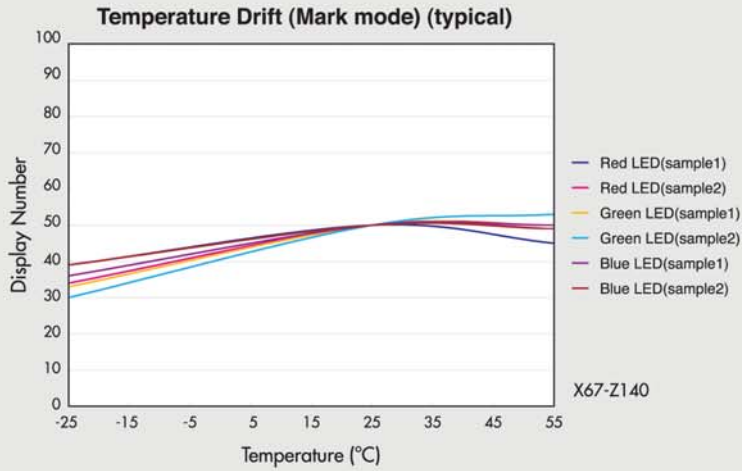
DM-18T

Accessory

**Reference (typical)**



DM-18T



- C
- E
- J
- J2
- J3
- V
- V2
- V3
- V4
- SR-Q
- S
- Z
- BGS-Z
- K
- FGS-D
- BGS-D
- BGS-2S
- Y
- DM-18T**
- Accessory