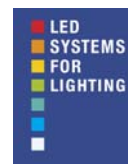


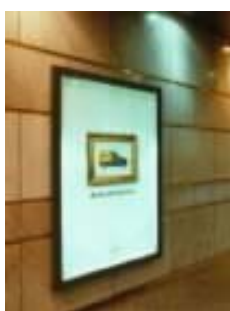
# Diffuse Displays



Application document for

**LINEARlight LM01A**  
**LINEARlight Flex LM10A**  
**LINEARlight Colormix LM01M-RGB**  
**LINEARlight Colormix Flex LM10L-RGB**

## 1. Description



Advertising display

For the homogeneous lighting of surfaces using light diffusing materials.

The light from the OSRAM LINEARlight coupled at the side is scattered in the material and therefore distributed over the entire surface to provide a homogeneously illuminated surface. The system can be used for ultra-thin advertising displays (single- or two-sided) or as a decorative feature in in-built wall and floor elements, also with dynamic variations in color. By using LINEARlight Flex it is also possible to create curved shapes and even special shapes.

## 2. Construction

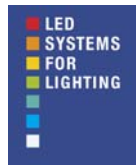


Data sheets on:  
<http://www.osram.com/products/led-systems>

**Note:** Please read the product data sheets for the LINEARlight LM01A, LINEARlight Flex LM10A, LINEARlight Colormix LM01M-RGB or LINEARlight Colormix Flex LM10L-RGB (subject to requirements) carefully. They contain important detailed instructions on safety and installation.

Also please read the instructions on the electrical installation of the operational devices: OPTOTRONIC® "Technical Guidelines" and the data sheets for the associated power supply units. Please refer to item 3f for the right power supply unit for each LED module.

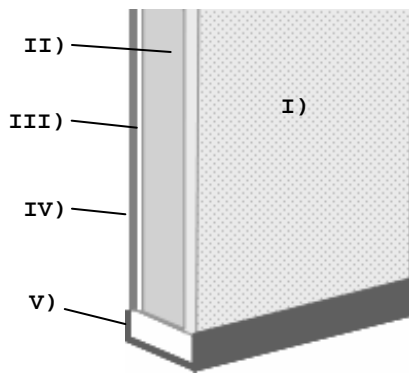
# Diffuse Displays



Application document for

**LINEARlight LM01A**  
**LINEARlight Flex LM10A**  
**LINEARlight Colormix LM01M-RGB**  
**LINEARlight Colormix Flex LM10L-RGB**

## Single-sided illumination

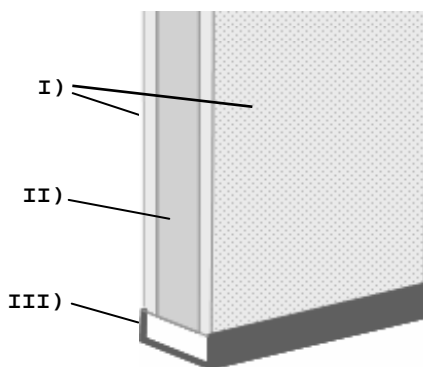


Cross-section of illuminated display

Components of structure:

- I) Diffuser
- II) Light diffusing acrylic glass panel
- III) Reflector
- IV) Cover panel
- V) Profile for mounting the LED module

## Two-sided illumination

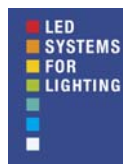


Cross-section of illuminated display

Components of structure:

- I) Diffuser
- II) Light diffusing acrylic glass panel
- III) Profile for mounting the LED module

# Diffuse Displays



Application document for

**LINEARlight LM01A**  
**LINEARlight Flex LM10A**  
**LINEARlight Colormix LM01M-RGB**  
**LINEARlight Colormix Flex LM10L-RGB**

## 3. Products

a) LED modules and CONNECTsystem

### LINEARlight LM01A

This linear LED module has a width of 10 mm, a total length of 448 mm and can be divided into units of 4 LED.



LINEARlight Flex  
LM10A

### LINEARlight Flex LM10A

This flexible LED tape with a self-adhesive back has a width of 10 mm and a total length of 8400 mm. It can be divided into units of 10 LED. The contacts are made by soldering cables to the solder pads provided.

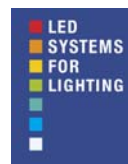
### LINEARlight Colormix LM01M-RGB

Every LED in this linear LED module contains a red, green and blue chip. This arrangement permits dynamic color applications in the smallest of spaces. It has a width of 11.5 mm, a total length of 450 mm and can be divided into units of 10 LED.

### LINEARlight Colormix Flex LM10L-RGB

This flexible LED tape with a self-adhesive back has a width of 11.5 mm and a total length of 4000 mm. It can be divided into units of 10 LED. The contacts are made by soldering cables to the solder pads provided.

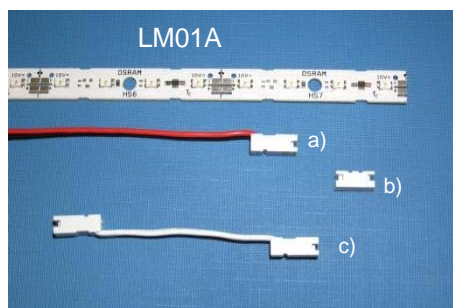
# Diffuse Displays



Application document for

**LINEARlight LM01A**  
**LINEARlight Flex LM10A**  
**LINEARlight Colormix LM01M-RGB**  
**LINEARlight Colormix Flex LM10L-RGB**

For the LINEARlight LM01A and LM01M-RGB, an OSRAM CONNECTsystem is available which has been developed specifically for these products.



LINEARlight LM01A and CONNECTsystem

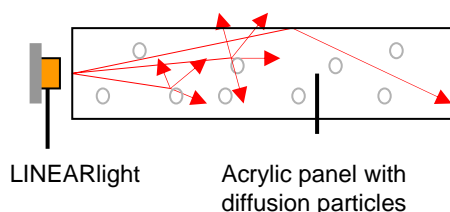
**Note:** The connection to the power supply unit and between modules is possible either with the CONNECTsystem or with a solder connection:

- for LM01A
- a) LM-2PIN            Power supply unit for operational device
  - b) LM-CONN            Plug-in connector (rigid)
  - c) LM-CONN-50            Plug-in connector (flexible)

- for LM01M-RGB
- LM-4PIN            Power supply unit for operational device

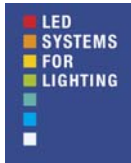
Given the differences in the coefficients of heat expansion between the holder profiles, LED modules and plug-in connectors, the LED modules and holder profiles have to be mounted with a small amount of play between them.

b) Acrylic panel with integrated diffusion particles



These special acrylic glass panels have the ability to scatter light which penetrates the edge of the panel evenly across surface. This is achieved with the fine particles integrated in the base material. Beams of light hitting the particles are refracted and scattered in all directions.

# Diffuse Displays



Application document for

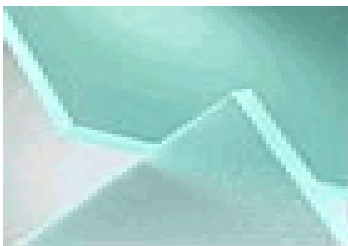
**LINEARlight LM01A**  
**LINEARlight Flex LM10A**  
**LINEARlight Colormix LM01M-RGB**  
**LINEARlight Colormix Flex LM10L-RGB**



Prismex illuminated display

The diffusion performance of the material depends on the quantity, the refraction index and the size of the integrated particles and the manufacturer ensures that these factors are properly coordinated with the size of the panels. These panels are offered by a range of companies:

- Röhme  
Plexiglas® GS 1002  
[www.rohme.de](http://www.rohme.de)
- Lucite International  
PERSPEX™ S-Lux SL 000, D-Lux DL 000 or  
Prismex PR 000, 5L-Lux 5L 000  
[www.lucitesolution.com](http://www.lucitesolution.com)
- Atoglas  
Altuglas® Elit II  
[www.atoglas.com](http://www.atoglas.com)

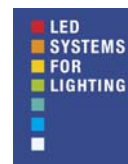


Altuglas® Elit II

In a single-sided display measuring 50 cm x 50 cm, a homogeneous luminance of up to 220 cd/m<sup>2</sup> per color can be achieved using the Elit II acrylic glass from Atoglas. Here the light from 3 LINEARlight LM10A units is coupled on all four sides of the glass.

**Note:** To achieve the maximum homogeneity, the size and thickness information specified by the companies must be carefully observed because the diffusion particle distribution in the material is coordinated to match the size and thickness.

# Diffuse Displays

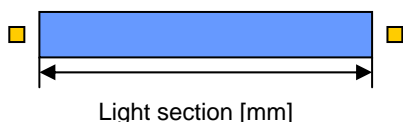


Application document for

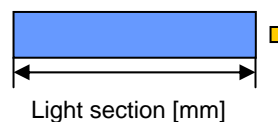
**LINEARlight LM01A**  
**LINEARlight Flex LM10A**  
**LINEARlight Colormix LM01M-RGB**  
**LINEARlight Colormix Flex LM10L-RGB**

This is illustrated in the tables below, using PLEXIGLAS® GS 1002 as an example. PLEXIGLAS® GS 1002 is available in sizes L , XL and CM (Custom Made).

For two-sided illumination:



For single-sided illumination:



Light section [mm]	Recommended GS 1002 Type	Recommended thickness [mm]
300 to 600	L	6 and 8
600 to 1300	XL	8, 10 and 12
Customer optimized	CM	Dependent on light area

Light section [mm]	Recommended GS 1002 Type	Recommended thickness [mm]
150 to 300	L	6 and 8
300 to 650	XL	8, 10 and 12
Customer optimized	CM	Dependent on light area

## c) Diffuser panel

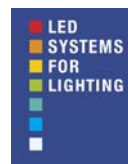


PLEXIGLAS SATINICE® DF

In order to increase the brightness (luminance) for the beholder it is advisable to apply a diffuser panel to the acrylic glass panel. This guides the light, which is widely scattered by the acrylic glass panel, in the direction of the beholder.

Such panels are offered, for example, by Röhm, with the name of PLEXIGLAS SATINICE® DF (0D010).

# Diffuse Displays

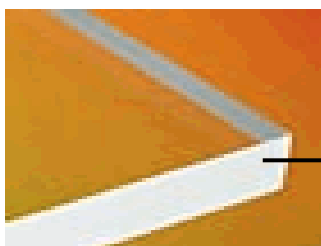


Application document for

**LINEARlight LM01A**  
**LINEARlight Flex LM10A**  
**LINEARlight Colormix LM01M-RGB**  
**LINEARlight Colormix Flex LM10L-RGB**

d) Rear reflector

For single-sided advertising or illuminated displays, a reflector is fitted behind the acrylic panel to reflect the emitted light forwards. It is recommended that highly reflective plastic panels or foil be used, as available from all advertising printers.



Adhesive aluminium tape

Acrylic glass panel with fitted reflector

e) Adhesive reflector tape

In order to reduce light losses associated with light escaping at the edges, the edges at which no light is coupled are sealed with a highly reflective material such as adhesive aluminium tape or white adhesive tape.

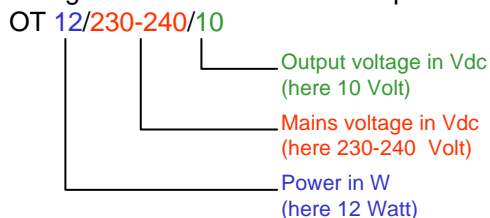
f) Power supply units

The power supply units to be used will depend on the type and length of the LINEARlight. The adjacent table will help with selection.

LINEARlight	ECG 10 V	ECG 24 V
LM01A	OT06 OT10 OT12 OT50	
LM01M-RGB LM10A LM10L-RGB		OT06 OT20 OT75

LINEARlight LM01A runs on 10 V. LINEARlight Colormix LM01M-RGB, LINEARlight Flex LM10A and LINEARlight Colormix Flex LM10L-RGB run on 24 V.

Categories of OPTOTRONIC® operational devices:



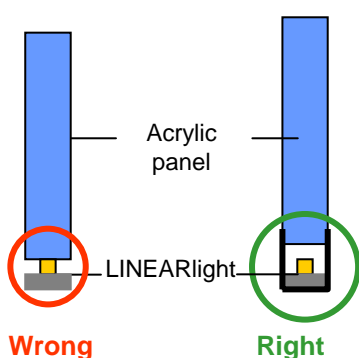
# Diffuse Displays



Application document for

**LINEARlight LM01A**  
**LINEARlight Flex LM10A**  
**LINEARlight Colormix LM01M-RGB**  
**LINEARlight Colormix Flex LM10L-RGB**

## 4. Installation



The holder profile of the display or illuminated sign must be made of sturdy material such as metal or acrylic. Metal offers the advantage of better heat dissipation if the module is fitted in direct contact with the holder profile. Its purpose is to connect the LED module and the acrylic panel with each other.

**Note:** It is important that the design of the holder profile does not result in the acrylic panel exerting any mechanical load on the LED modules. This can be prevented by use of spacers or fitting the LED module at the side.

### Step 1

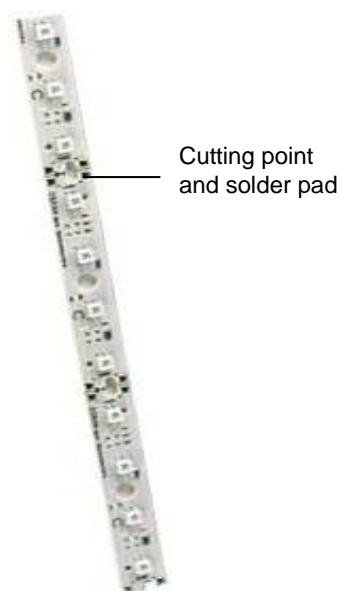
The LED modules are cut to the length of the holder profile or, in the case of rigid LINEARlights, extended with the aid of the plug-in connector or soldering.

**Note:** Make the cuts only at the places marked with a “✂” symbol.

### Step 2

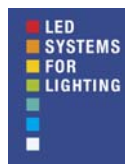
To connect the LINEARlight Flex and LINEARlight Colormix Flex to the power supply unit, solder two cables for infeed voltage to the solder points marked by a plus and minus (+/-) either at the ends or in the middle. The rigid LINEARlights can be connected either by means of plug-in connectors or soldering.

**Note:** For further electrical data and circuit instructions, please refer to the data sheet.



LINEARlight  
OS-LM01A

# Diffuse Displays



Application document for

**LINEARlight LM01A**  
**LINEARlight Flex LM10A**  
**LINEARlight Colormix LM01M-RGB**  
**LINEARlight Colormix Flex LM10L-RGB**

## Step 3

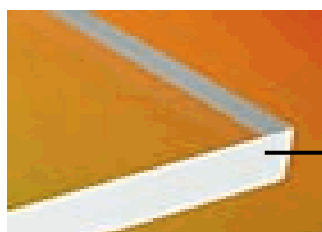
Fastening:

**Version a:**

LINEARlights Flex LM10A and Colormix Flex LM10L-RGB are supplied with self-adhesive backs for fastening to the holder profile.

**Version b:**

The rigid LINEARlights LM01A and Colormix LM01M-RGB are fastened using either adhesive tape or size-M4 screws inserted through the holes provided ( $\varnothing$  4.05 mm).



Adhesive aluminium tape

Acrylic glass panel with fitted reflector

## Step 4

In order to reduce light losses at the edges, it is recommended that the edges at which no light is coupled be sealed with a highly reflective material such as adhesive aluminium tape or white adhesive tape. These types of adhesive aluminium tape are available from most advertising printers.

## Step 5

Then connect the LED module to a corresponding OSRAM OPTORONIC® operational device and connect all the separate components.

**Note:** For dynamic color mixing with the LINEARlight Colormix LM01M-RGB and LINEARlight Colormix Flex LM10L-RGB, the OT RGB 3-Channel DIM and OT RGB Sequencer DIM operational devices are available.