



# ELEMENTARY TECHNOLOGIES

**LIGHTING DESIGN** PROJECT INSTALLATIONS

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# PROJECT:

## FLEXISTORE – REMBRANDT MALL



Interior  
Corridor

**Date:** July 2023.

**Industry:** Commercial.

**Area:** Paarl, Western Cape .

**Tag:** New Install, LED Strip, BLE.

### Client Requirement:

- *Create a lighting system that has reduced power consumption.*
- *Easy to set up with low installation cost.*

## PROJECT SUMMARY

Nestled within Rembrandt Mall in Paarl, the newly established storage facility faced the challenge of achieving the perfect balance between optimal illumination and energy efficiency. To meet these requirements, we proposed a comprehensive LED linear lighting solution designed to cater to the diverse needs of the customers throughout the store.

Five-metre-long LED luminaires operate at 24V DC and 15W/m with a light output of 1 515 lumens per meter which seamlessly illuminates the entire store. The LED strip is housed in an aluminium extrusion that dissipates the heat evenly across the entire length to ensure optimal operational conditions are met based on the storage lighting application. The correlated colour temperature is natural white at 4000K with a CRI rating of >90. This combined with the glossy white finishing within the store ensures that the light levels comply with the SANS interior lighting standard to provide a safe and well-illuminated environment for the customers.

To further increase the energy efficiency of the lighting system, we installed passive infrared occupancy sensors to automatically control the light output according to the presence of customers in the corridors. To address the low installation cost requirement, we implemented a wireless communication protocol, Bluetooth Mesh, to communicate between the motion sensors and luminaires to negate the need for additional bus wiring.

## The control methodology functions as follows:

- When presence is detected, the luminaires will turn on to 100% light output.
- At the point of last detection, a timer of 10 mins will begin to trigger the next action. If motion is detected during this time, the timer will reset.
- After the time has elapsed, the light output will automatically dim down to 30% and another timer will begin of 5 mins.
- If no motion is detected after the 5 mins, the luminaire will switch off.

Using the lighting control methodology mentioned above, the luminaire operational time was reduced by up to 60% making it an ideal scheme for low foot traffic commercial spaces.

In summary, the lighting solution for this commercial storage facility reaches an efficient balance between energy conservation and effective illumination. We've implemented a smart lighting control system that operates through motion sensors and Bluetooth Mesh technology that ensures safety and cost-effectiveness by adjusting lighting output based on detected activity levels. This practical approach not only improves the customer experience but also significantly reduces operational costs.

### AREA & LUMINAIRE TYPE

- Corridor – 5m pieces of 15W/m LED end-to-end strip in aluminium extrusion

### LIGHT QUALITY

- CCT – 4000K
- CRI – >90
- Flicker (at full load) –  $\leq 1$
- Stroboscopic effect (at full load) –  $\leq 0.4$

### SENSOR CONTROL

- Presence detection

### LIGHTING CONTROL PROTOCOL

- Bluetooth Mesh

### LIGHT OUTPUT

- 101 lm/W
- 1 515 lm/m

### LIGHTING STANDARDS

- SANS 10114

### HARDWARE DEVICES

- Tridonic
- CP Electronics
- GT Development

### WARRANTY

- 5 Years



## RESULTS ACHIEVED

### INTERIOR LUX LEVEL

- **Required:** 100 – 200 lx | **Achieved:** 150 – 250 lx

### ENERGY CONSUMPTION REDUCTION

- **60%**