

## LIGHT EMITTING DIODES (LED) TRAFFIC SIGNAL LIGHTS SYSTEM FOR SINGAPORE

### CUSTOMER

**Land Transport Authority of Singapore**

### GENERAL

Singapore Technologies Electronics Limited (ST Electronics) was awarded a contract by the Land Transport Authority (LTA) in April 1999 to carry out an islandwide replacement of the existing filament-lamp based traffic signal lights with Light Emitting Diodes (LED).

The contract encompasses retrofitting of about 69,000 traffic signal lights at more than 1,500 traffic junctions all over Singapore. The project was divided into seven stages and the entire replacement was completed in mid-2001. When completed, Singapore is the first country in the world to have a country-wide installation of installed LED traffic signals.

The Optical Assembly which essentially delivers a monochromatic light output is made up of tiny LEDs that give out excellent brightness. It does not require filters to obtain the desired colour.

**Incandescent  
Traffic Light**



**LED Traffic  
Light**



Thus it is not subject to the sun-phantom effect which occurs in a traditional filament-lamp based assembly when sun shines directly on it. As it is a semi-conductor device, an LED is less likely to fail prematurely due to shock and vibration.

A survey commissioned to gauge the public acceptance of the new LED has shown that more than 90% of the respondents were satisfied with the features of the new traffic signal lights. Better visibility and good colour contrast are some of the reasons the public preferred LED signal lights over the incandescent ones for urban traffic signal lights.



Compared to conventional incandescent / halogen type lamps, ST Electronics' Optical Assembly has the following advantages:

- **Compact and Rugged:**  
Mechanically rugged design makes them less sensitive to shock or vibration.
- **Filterless Design:**  
Eliminates problem of sun phantom effect usually found in incandescent lamp based traffic signal lights.
- **Low power Consumption:**  
Save as much as 75-90% power, making them more cost-effective.
- **Easy Retrofitting:**  
The assembly can be retrofitted by replacing incandescent light assemblies without having to modify the traffic light controllers.

- **Long Operating Life-Span:**  
Expected life of more than 5 years, minimising maintenance & life cycle cost.
- **Built-in Dimmer Mode:**  
Specially incorporated circuits that automatically switches to dimming mode during the night.
- **Easy-On-The-Eye Design:**  
Unnecessary glare is reduced due to the even spread of brightness.
- **Reliable Operation:**  
Continued operation even when some LEDs should fail.

### Optical Assembly (OA) Overview

The ST Electronics designed Optical Assembly (OA) consist of 5 physical components :

- Lens
- Rubber Gasket
- Display Board
- Driver Board
- Water Resist Cover

The functional modules of the OA include :

- Fault Indication
- Power Module
- LED Array
- Logic Power Module
- Dimming Control
- Fault Detection

### SYSTEM FEATURES

- Day /Night mode detection and intensity level selection
- LED Fault Detection/Indication
- Load Compatibility
- High Luminous Intensity
- IP 65 Compatible
- Modular Design
- No Modification required on Traffic Light Controllers
- Environmental robustness

