

OpenPLC Traffic Light & Switchboard Modules

Spoken Tutorial Project

<https://spoken-tutorial.org>

National Mission on Education through ICT

<http://sakshat.ac.in>

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Learning Objectives



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- **OpenPLC Traffic Light module**



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- **OpenPLC Traffic Light module**
- **OpenPLC Switchboard module**



System Requirements



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- **Ubuntu Linux 18.04 operating system**



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- **OpenPLC Traffic Light module**



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- **OpenPLC Traffic Light module**
- **OpenPLC Switchboard module**



System Requirements

- **Ubuntu Linux 18.04 operating system**
- **OpenPLC Traffic Light module**
- **OpenPLC Switchboard module**
- **OpenPLC version 1 Mainboard**



System Requirements

- **Ubuntu Linux 18.04 operating system**
- **OpenPLC Traffic Light module**
- **OpenPLC Switchboard module**
- **OpenPLC version 1 Mainboard**
- **24V, 2A SMPS**



Pre-requisites



Pre-requisites

- **OpenPLC version 1 Mainbaord**



Pre-requisites

- **OpenPLC version 1 Mainbaord**
- **If not, please refer to the relevant tutorials in this series from <https://spoken-tutorial.org>**



Traffic Light Module

This module is used to



Traffic Light Module

This module is used to

- **implement the working of traffic lights**



Traffic Light Module

This module is used to

- **implement the working of traffic lights**
- **visualize the status of any process with the built-in LEDs**



LED to glow

For any LED to glow you should follow the below:



LED to glow

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LED to glow

For any LED to glow you should follow the below:

- +5V pin should be given 5V



LED to glow

For any LED to glow you should follow the below:

- +5V pin should be given 5V
- EN and the respective LED pin should be grounded or given a logic-low signal



How can the Traffic Light module be powered?



How can the Traffic Light module be powered?

Traffic Light module can be powered using the output power pins of the Mainboard



Switchboard Module



Switchboard Module

- **The goal of this module is to get familiarized with different types of switches**



Switchboard Module

- The goal of this module is to get familiarized with different types of switches
- In particular their usage in the real time applications in industries



Main Components



Main Components

- 4 Normally Open switches



Main Components

- 4 Normally Open switches
- 4 Normally Closed switches



Main Components

- 4 Normally Open switches
- 4 Normally Closed switches
- 2 Latched action switches



Main Components

- 4 Normally Open switches
- 4 Normally Closed switches
- 2 Latched action switches
- LEDs for each switch



Types of Switches



Types of Switches

- **Normally Open (NO)**



Types of Switches

- **Normally Open (NO)**
- **Normally Closed (NC)**



Types of Switches

- **Normally Open (NO)**
- **Normally Closed (NC)**
- **Latched action (L)**



Important Note



Important Note

- **NO** and **Latched action** switches must be connected to the I/Os of the microcontroller



Important Note

- **NO** and **Latched action** switches must be connected to the I/Os of the microcontroller
- Only then the LEDs of the corresponding switches will work



Important Note

- LEDs of **NC** switches will work, even if they are not connected to the I/Os of the microcontroller



Normally Open (NO) Switch



Normally Open (NO) Switch

- The output pin of a NO switch will read logic 0 when it is not pressed



Normally Open (NO) Switch

- The output pin of a NO switch will read logic 0 when it is not pressed
- When the switch is pressed, the output pin will read 5V



Normally Open (NO) Switch

- The output pin of a NO switch will read logic 0 when it is not pressed
- When the switch is pressed, the output pin will read 5V
- This is due to the supply from the microcontroller's internal pull up register



Normally Closed (NC) Switch



Normally Closed (NC) Switch

- The output pin of a NC switch will read 5V when it is not pressed



Normally Closed (NC) Switch

- The output pin of a NC switch will read 5V when it is not pressed
- This is due to the supply from the microcontroller's internal pull up register



Normally Closed (NC) Switch

- The output pin of a NC switch will read 5V when it is not pressed
- This is due to the supply from the microcontroller's internal pull up register
- Upon switch press, the output pin will read logic 0 or Ground



Latched Action (L) Switch



Latched Action (L) Switch

- It is basically a **push-to-make, push-to-break** type of switch



Latched Action (L) Switch

- It is basically a **push-to-make, push-to-break** type of switch
- The output pin will read 5V, when it is pressed for the first time



Latched Action (L) Switch

- It is basically a **push-to-make, push-to-break** type of switch
- The output pin will read 5V, when it is pressed for the first time
- The output pin will read 0V, when it is pressed for the second time



How can the Switchboard module be powered?



How can the Switchboard module be powered?

Switchboard module can be powered using the output power pins of the Mainboard



Summary

In this tutorial, we learnt about

- **OpenPLC Traffic Light module**
- **OpenPLC Switchboard module**



About the Spoken Tutorial Project

- Watch the video available at https://spoken-tutorial.org/What_is_a_Spoken_Tutorial
- It summarises the Spoken Tutorial project
- If you do not have good bandwidth, you can download and watch it



Spoken Tutorial Workshops

The Spoken Tutorial Project Team

- Conducts workshops using spoken tutorials
- Gives certificates to those who pass an online test
- For more details, please write to contact@spoken-tutorial.org



Forum questions

- Questions in THIS Spoken Tutorial?
- Visit <https://forums.spoken-tutorial.org/>
- Choose the minute and second where you have the question
- Explain your question briefly
- The Spoken Tutorial project will ensure an answer

You will have to register to ask questions



Forum for specific questions

- Questions not related to the Spoken Tutorial?
- Do you have general / technical questions on the Software?
- Please visit the FOSSEE Forum
<https://forums.fossee.in/>
- Choose the Software and post your question



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THANK YOU!

For more Information, visit our website
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