

# 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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# System Requirements

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



# System Requirements

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



# Pre-requisites



# Pre-requisites

- **OpenPLC Mainboard**



# Pre-requisites

- OpenPLC Mainboard
- 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:**



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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](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](mailto: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  
<https://fossee.in/>

