

OpenPLC

Runtime setup

Raspberry Pi
Pi - F5 / T5

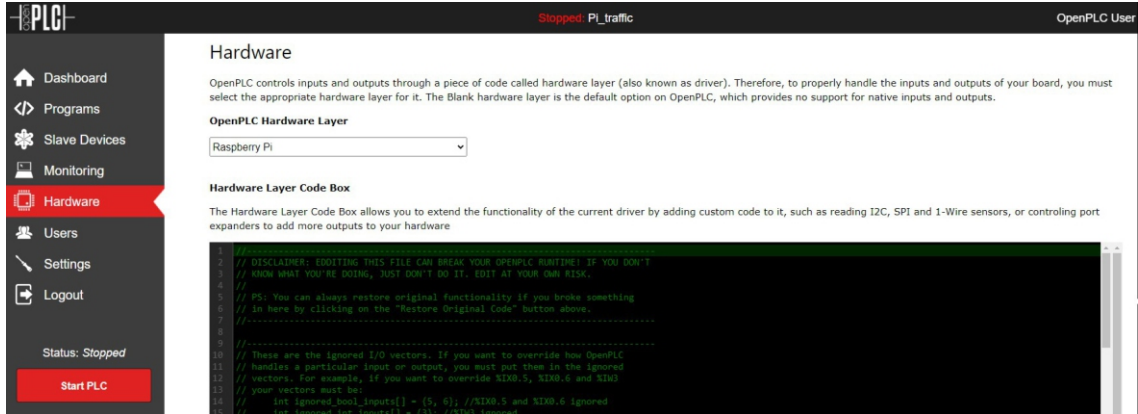
1. Raspberry Pi - F5 / Pi - T5

Install OpenPLC on Raspberry Pi:

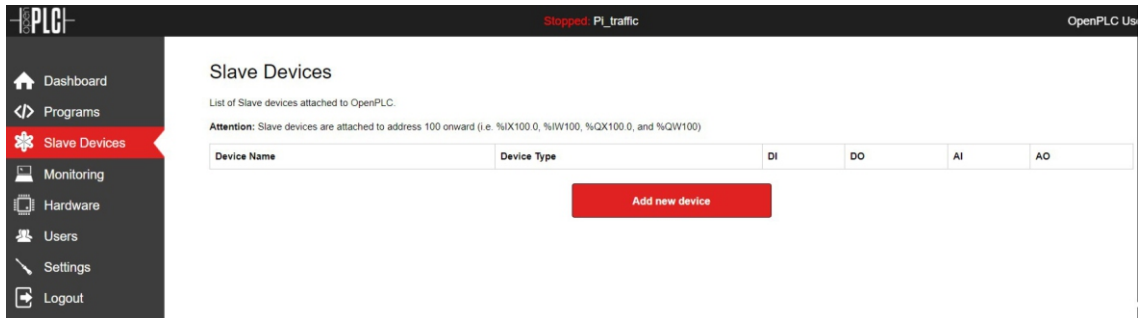
OpenPLC Home site for Raspberry: <https://www.openplcproject.com/runtime/raspberry-pi/>

Copy raspberrypi.cpp (in downloaded zip file) to /home/pi/OpenPLC_v3/webserver/core/hardware_layers

Start Runtime in web browser with IP address (Pi or PC connected to Pi IP).



Hardware setup to: Raspberry Pi



Slave Device to: no device

Inputs and Outputs default setting:

- DI - digital inputs (5,6,16,17,18,19,26,27)%IX0.0 - %IX0.7
- DO - digital outputs (23,22,25,24,13,12,21,20)%QX0.0 - %QX0.7
- AI - analog inputs (A0,A1,A2,A3)%IW0 - %IW3

Raspberry Pi - F5 / T5		
Digital Inputs	Location	Type
5	%IX0.0	BOOL
6	%IX0.1	BOOL
16	%IX0.2	BOOL
17	%IX0.3	BOOL
18	%IX0.4	BOOL
19	%IX0.5	BOOL
26	%IX0.6	BOOL
27	%IX0.7	BOOL
Analog Inputs	Location	Type
A0	%IW0	UINT
A1	%IW1	UINT
A2	%IW2	UINT
A3	%IW3	UINT
Outputs		
23	%QX0.0	BOOL
22	%QX0.1	BOOL
25	%QX0.2	BOOL
24	%QX0.3	BOOL
13	%QX0.4	BOOL
12	%QX0.5	BOOL
21	%QX0.6	BOOL
20	%QX0.7	BOOL

Settings

- Enable Modbus Server
Modbus Server Port 502
- Enable DNP3 Server
DNP3 Server Port 20000
- Enable EtherNet/IP Server
EtherNet/IP Server Port 44818
- Enable Persistent Storage Thread
Persistent Storage polling rate 10
- Start OpenPLC in RUN mode

Slave Devices

Polling Period (ms) 100

Timeout (ms) 1000

Save Changes

Settings: default

Programs

Here you can upload a new program to OpenPLC or revert back to a previous uploaded program shown on the table.

Program Name	File	Date Uploaded
Pi_traffic	90958.st	Mar 09, 2021 - 10:57PM
Pi_LED	27495.st	Feb 12, 2021 - 03:21PM
Blank Program	blank_program.st	May 24, 2018 - 08:02PM

List all programs

Upload Program

Choose File No file chosen Upload Program

Uploaded programs list.

Dashboard

Status: **Running**

Program: Pi_traffic

Description:

File: 90958.st

Runtime: 2 seconds

Runtime Logs

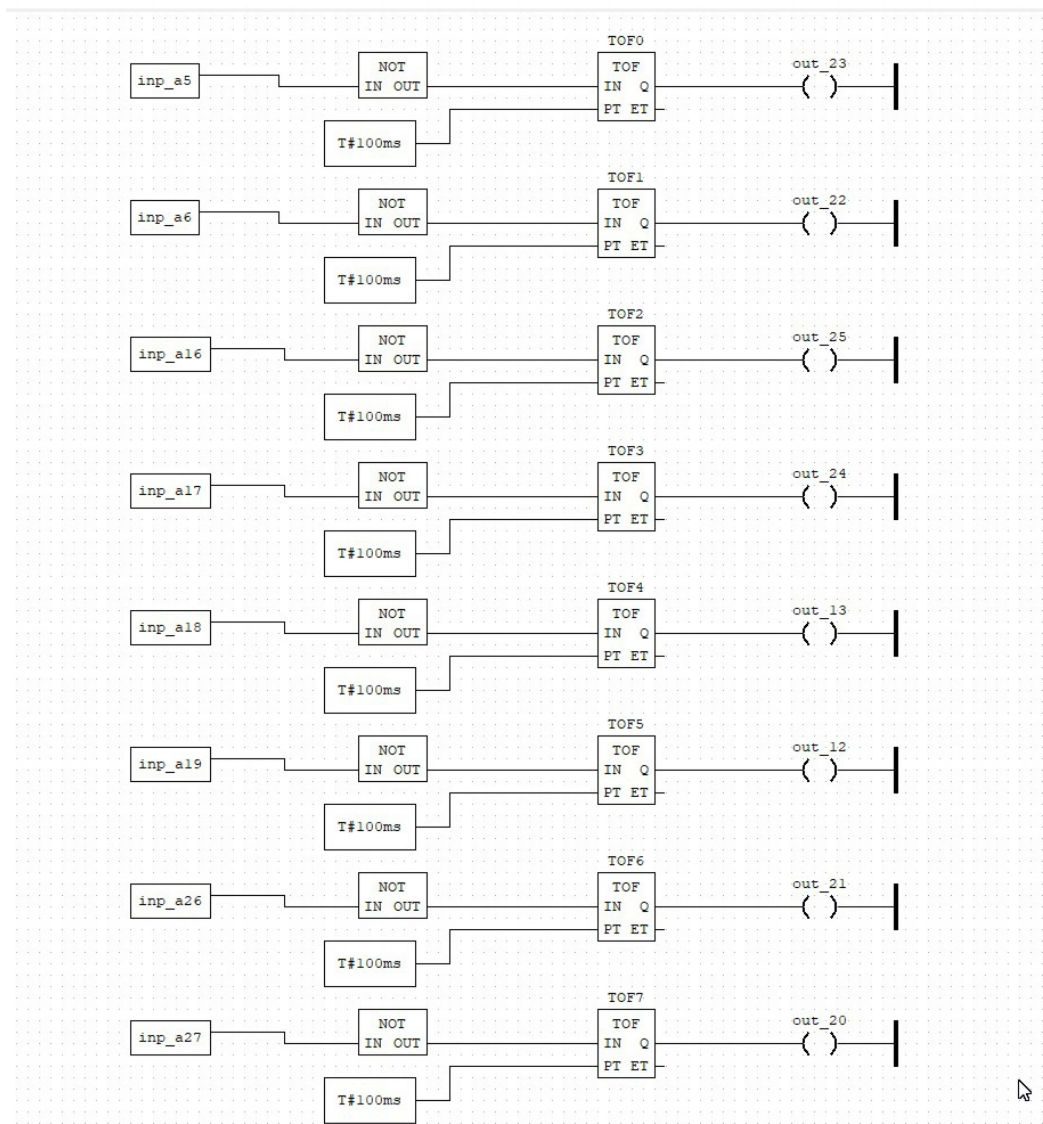
```
OpenPLC Runtime starting...
Interactive Server: Listening on port 43628
Warning: Persistent Storage file not found
Issued start_modbus() command to start on port: 502
Server: Listening on port 502
Server: waiting for new client...
Issued start_dnp3() command to start on port: 20000
DNP3 ID manager: Starting thread (0)
DNP3 ID DNP3_Server: Listening on: 0.0.0.0:20000
Issued start_enip() command to start on port: 44818
Server: Listening on port 44818
Server: waiting for new client...
Issued stop_storage() command
```

Copy logs

Uploaded program is running.

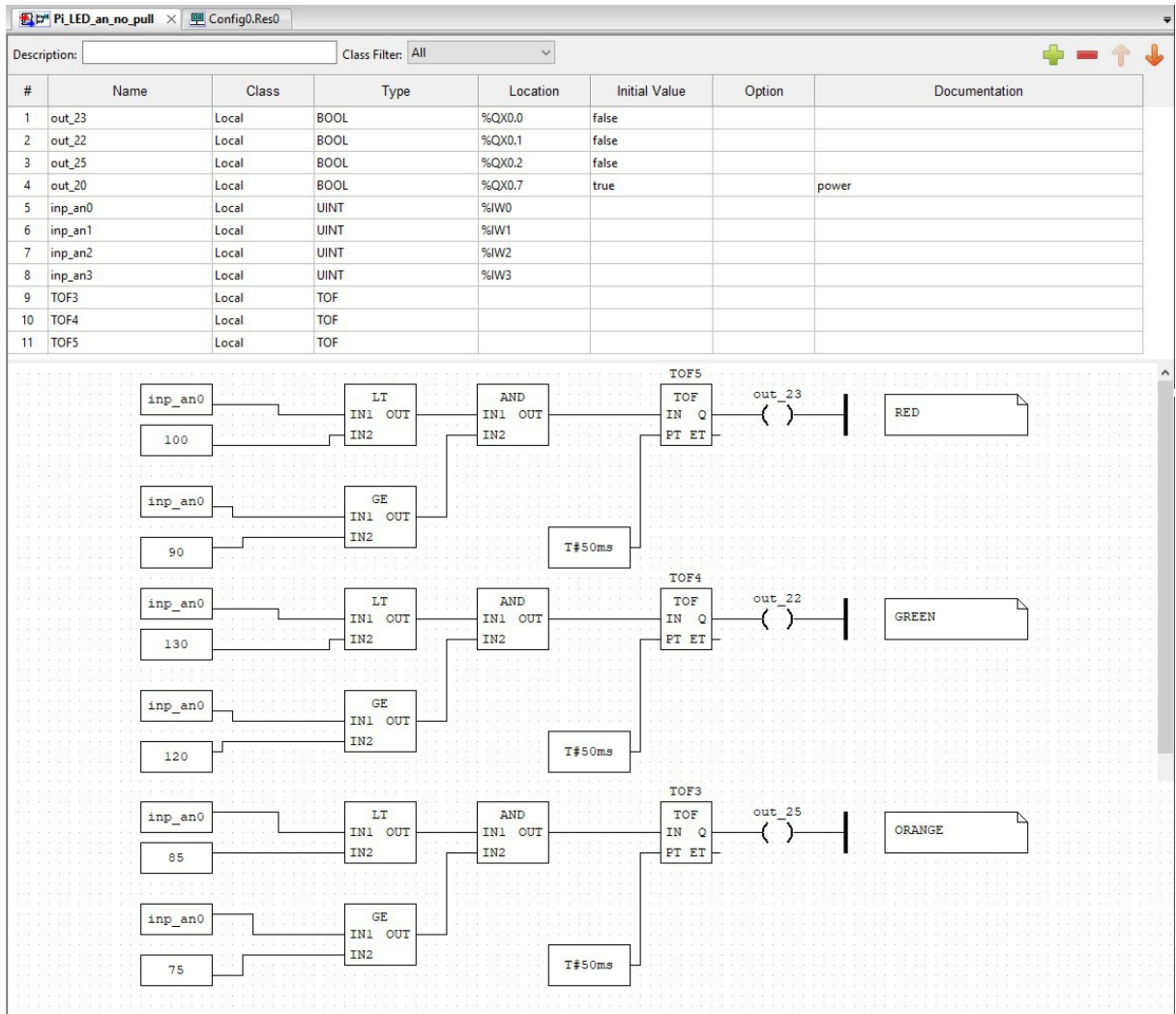
2. Raspberry Pi test program Pi - F5 / Pi -T5

#	Name	Class	Type	Location	Initial Value	Option	D
1	out_23	Local	BOOL	%QX0.0	false		
2	out_22	Local	BOOL	%QX0.1	false		
3	out_25	Local	BOOL	%QX0.2	false		
4	out_24	Local	BOOL	%QX0.3	false		
5	out_13	Local	BOOL	%QX0.4	false		
6	out_12	Local	BOOL	%QX0.5	false		
7	out_21	Local	BOOL	%QX0.6	false		
8	out_20	Local	BOOL	%QX0.7	false		
9	inp_a5	Local	BOOL	%IX0.0	false	5	
10	inp_a6	Local	BOOL	%IX0.1	false	5	
11	inp_a16	Local	BOOL	%IX0.2	false	5	
12	inp_a17	Local	BOOL	%IX0.3	false	5	
13	inp_a18	Local	BOOL	%IX0.4	false	5	
14	inp_a19	Local	BOOL	%IX0.5	false	5	
15	inp_a26	Local	BOOL	%IX0.6	false	5	
16	inp_a27	Local	BOOL	%IX0.7	false	5	
17	TOF0	Local	TOF				
18	TOF1	Local	TOF				
19	TOF2	Local	TOF				
20	TOF3	Local	TOF				
21	TOF4	Local	TOF				
22	TOF5	Local	TOF				
23	TOF6	Local	TOF				
24	TOF7	Local	TOF				



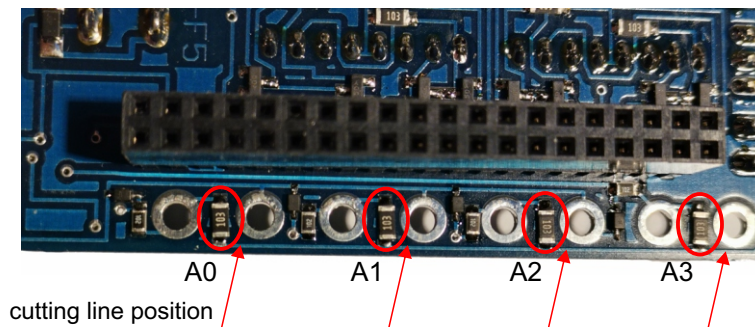
Connect inp_a27 to GND and LED on out_20 will start to light for 100ms. Same for all other.

3. Analog inputs - sample program for color sensor



4. Removing PULL UP resistors

Some sensors will work better if no PULL UP resistor (COLOR) is connected to the inputs. If you decide to remove the PULL UP sensor, we recommend that you do so only at one or max. two inputs. If the input does not have a PULL UP or PULL DOWN resistor, the input will have a floating signal between 0 - 3.3V until we connect a sensor to it.



PULL UP resistors

You can remove the PULL UP resistors by desoldering them, or by cutting the wire to which they are connected. If you want to remove the resistor for the A0 input, cut the line only at the position next to the resistor. If you want to remove the resistors for inputs A0 and A1 you have to cut the lines in both places next to the PULL UP resistors. The same goes for the other resistors you want to remove.