OpenPLC

Runtime setup

Arduino Uno-F5
Arduino Mega-F5

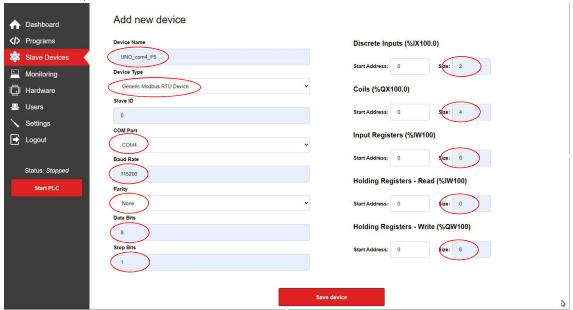## 1. Arduino Uno + Uno-F5/T5

OpenPLC Home site: https://www.openplcproject.com/runtime/
Install OpenPLC on your PC and upload firmware to UNO or Mega board.
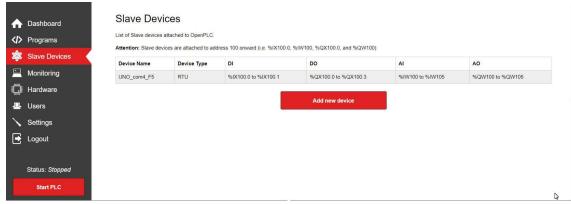Start Runtime in web browser.

Hardware

OpenPLC controls inputs and outputs through a piece of code called hardware layer (also known as driver). Therefore, to properly handle the inputs and outputs of your board, you must select the appropriate hardware layer for it. The Blank hardware layer is the default option on OpenPLC, which provides no support for native inputs and outputs.

OpenPLC Hardware Layer

Blank

Hardware Layer Code Box

The Hardware Layer Code Box allows you to extend the functionality of the current driver by adding custom code to it, such as reading I2C, SPI and 1-Wire sensors, or controling port expanders to add more outputs to your hardware

```
//------------------------------------------------------------
// DISCLAIMER: EDDITING THIS FILE CAN BREAK YOUR OPENPLC RUNTIME! IF YOU DON'T
// KNOW WHAT YOU'RE DOING, JUST DON'T DO IT. EDIT AT YOUR OWN RISK.
//
// PS: You can always restore original functionality if you broke something
// in here by clicking on the "Restore Original Code" button above.
//
//------------------------------------------------------------
// These are the ignored I/O vectors. If you want to override how OpenPLC
// handles a particular input or output, you must put them in the ignored
```

Hardware setup to: Blank

Add new device

Device Name
UNO_com4_F5

Device Type
Generic Modbus RTU Device

Slave ID
0

COM Port
COM4

Baud Rate
115200

Parity
None

Data Bits
8

Stop Bits
1

Discrete Inputs (%IX100.0)
Start Address: 0   Size: 2

Coils (%QX100.0)
Start Address: 0   Size: 4

Input Registers (%IW100)
Start Address: 0   Size: 6

Holding Registers - Read (%IW100)
Start Address: 0   Size: 0

Holding Registers - Write (%QW100)
Start Address: 0   Size: 6

Save device

Device Name: as you wish**.**
Device Type: Generic Modbus RTU Device.
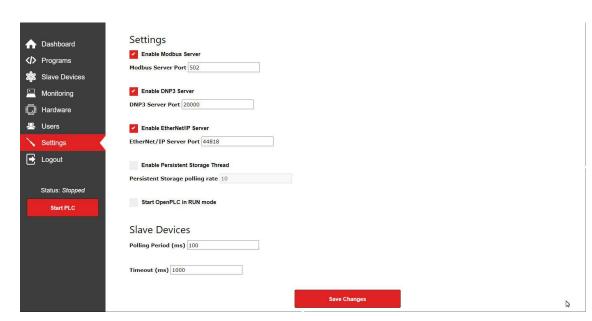**COM port**: to which the Arduino is connected.
Baud Rate: 115200
Parity: None
Data Bits: 8
Stop Bits: 1

Descrete Inputs (%IX100.0): ....start 0 Size 2.
Coils (%QX100.0): ....start 0 Size 4.
Input Registers (%IW100): ....start 0 Size 6.
Holding Registers - Read(%IW100): .....start 0 Size 0.
Holding Registers - Write(%QW100.0): start 0 Size 6.

Slave Devices

List of Slave devices attached to OpenPLC.

Attention: Slave devices are attached to address 100 onward (i.e. %IX100.0, %IW100, %QX100.0, and %QW100)

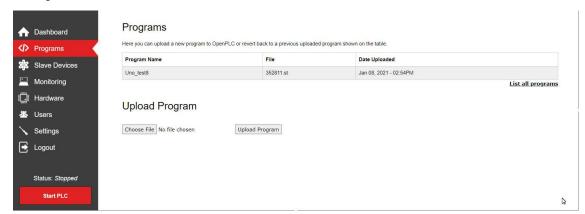| Device Name	Device Type	DI	DO	AI	AO
UNO_com4_F5	RTU	%IX100.0 to %IX100.1	%QX100.0 to %QX100.3	%IW100 to %IW105	%QW100 to %QW105

Add new device

Input and Output address (Uno-F5):
AI   - analog inputs   (A0 - A5) ....%IW100   - %IW105
AO   - analog outputs (3,5,6,9,10,11) %QW100   - %Qw105
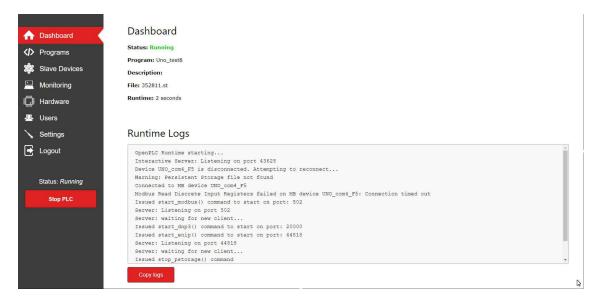DI   - digital inputs   (2,7) ....%IX100.0 - %QI100.1
DO - digital ouputs   (4,8,12,13) ......%QX100.0 - %QX100.3

Settings

Dashboard
Programs
Slave Devices
Monitoring
Hardware
Users
Settings
Logout

Status: *Stopped*

Start PLC

☑ **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

Dashboard
Programs
Slave Devices
Monitoring
Hardware
Users
Settings
Logout

Status: *Stopped*

Start PLC

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
Uno_test8	352811.st	Jan 08, 2021 - 02:54PM

List all programs

Upload Program

Choose File   No file chosen   Upload Program

Uploaded programs list.

Dashboard

Dashboard
Programs
Slave Devices
Monitoring
Hardware
Users
Settings
Logout

Status: *Running*

Stop PLC

Status: Running

Program: Uno_test8

Description:

File: 352811.st

Runtime: 2 seconds

Runtime Logs

```
OpenPLC Runtime starting...
Interactive Server: Listening on port 43628
Device UNO_com4_F5 is disconnected. Attempting to reconnect...
Warning: Persistent Storage file not found
Connected to MB device UNO_com4_F5
Modbus Read Discrete Input Registers failed on MB device UNO_com4_F5: Connection timed out
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
Issued start_enip() command to start on port: 44818
Server: Listening on port 44818
Server: waiting for new client...
Issued stop_pstorage() command
```
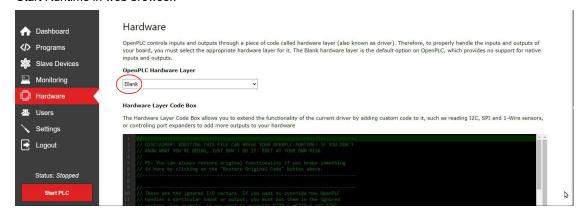
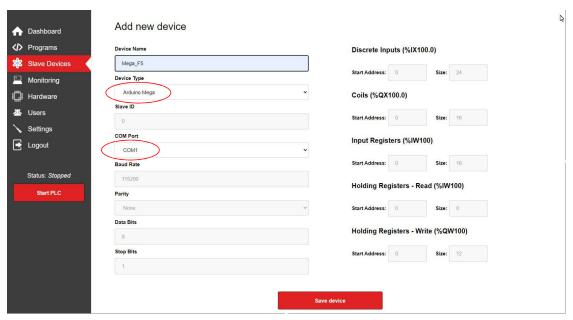Copy logs

Uploaded program is running.

2. Arduino Mega + Mega-F5/T5
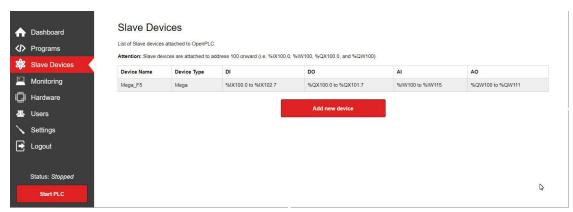
Start Runtime in web browser.
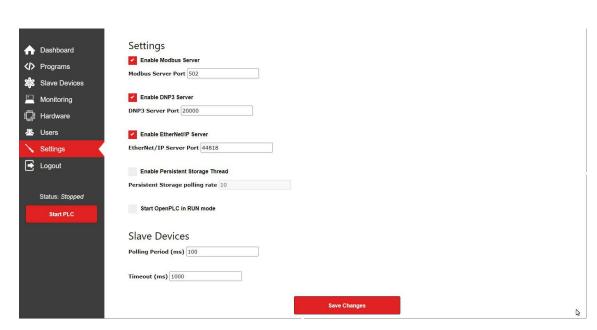
Hardware setup to: Blank

Device Name as you wish**.**
COM port to which the Arduino is connected.
For **Device Type** select Arduino Mega.
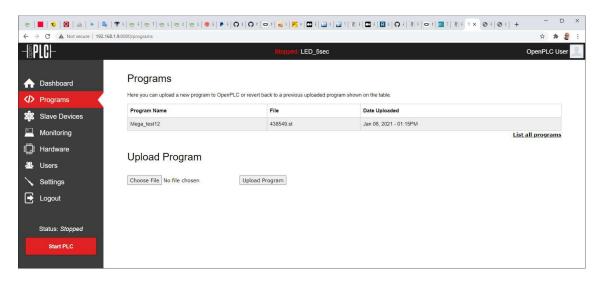
Input and Output address (Mega-F5):

          AI   - analog inputs   (A0 - A11) %IW100   - %IW111
          AO - analog outputs (2 - 13)   %QW100 - %QW111
          DO - digital ouputs   (16 - 17)   %QX100.0 - %QX100.1

Settings: default

Uploaded programs list.

Arduino Uno - F5 / T5

Inputs		Location	Type
	2	%IX100.0	BOOL
	7	%IX100.1	BOOL
	A0	%IW100	WORD
	A1	%IW101	WORD
	A2	%IW102	WORD
	A3	%IW103	WORD
	A4	%IW104	WORD
	A5	%IW105	WORD
Outputs			
	3	%Qw100	WORD
	5	%QW101	WORD
	6	%QW102	WORD
	9	%QW103	WORD
	4	%QX100.0	BOOL
	8	%QX100.1	BOOL
	10	%QW104	WORD
	11	%QW105	WORD

Arduino Mega - F5 / T5

Inputs		Location	Type
	A0	%Iw100	WORD
	A1	%IW101	WORD
	A2	%IW102	WORD
	A3	%IW103	WORD
	A4	%IW104	WORD
	A5	%IW105	WORD
	A6	%IW106	WORD
	A7	%IW107	WORD
	A8	%IW108	WORD
	A9	%IW109	WORD
	A10	%IW110	WORD
	A11	%IW111	WORD
Outputs		**Location**	**Type**
	16	%QX100.0	BOOL
	17	%QX100.1	BOOL
	4	%QW102	WORD
	5	%QW103	WORD
	6	%QW104	WORD
	7	%QW105	WORD
	8	%QW106	WORD
	9	%QW107	WORD
	10	%QW108	WORD
	11	%QW109	WORD
	12	%QW110	WORD
	13	%QW111	WORD