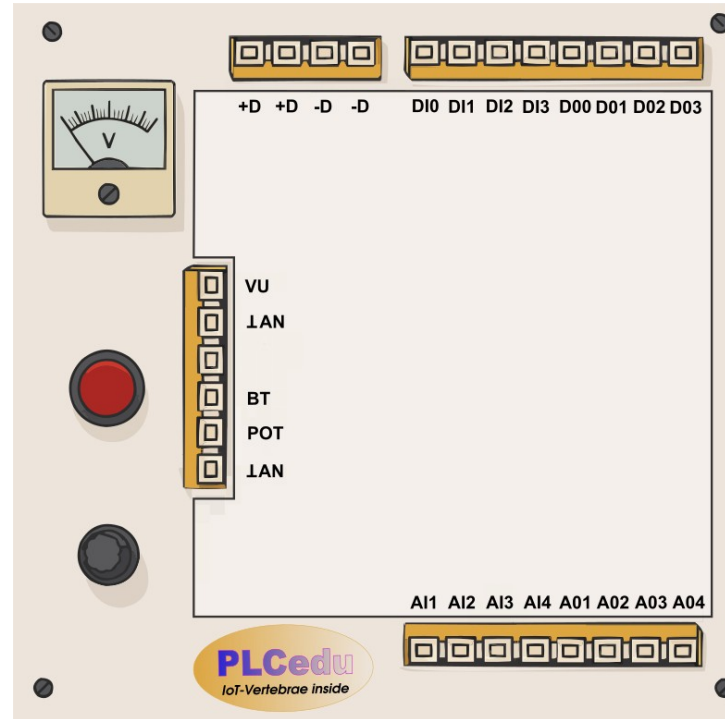
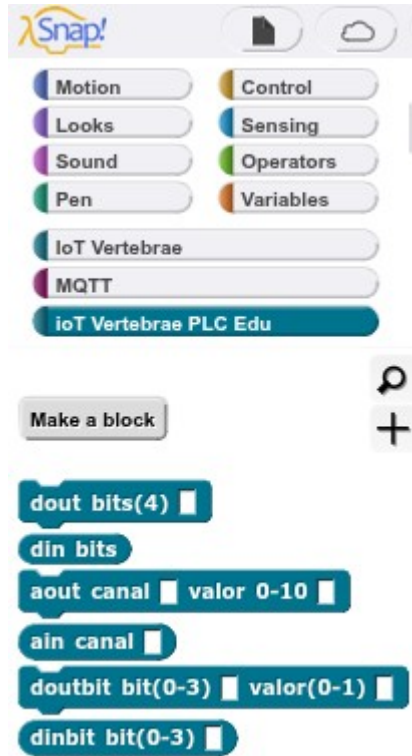


# PLCedu

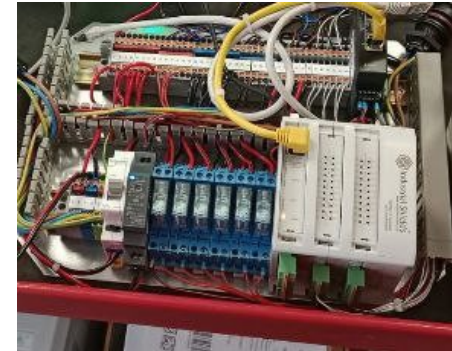
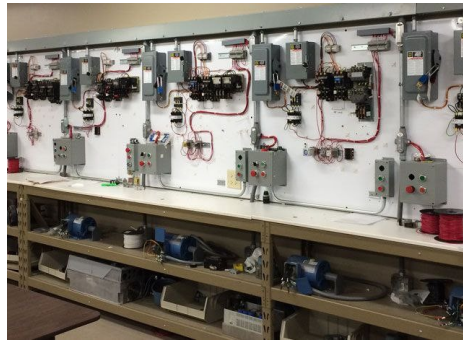
## Educational PLC with Snap!



# What is a PLC?

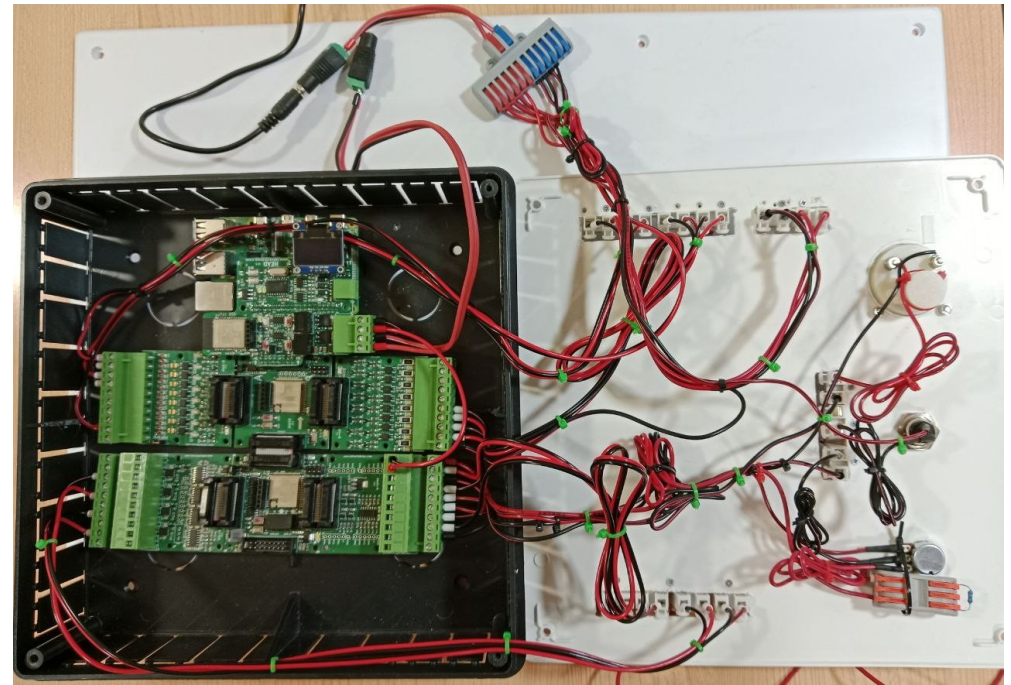
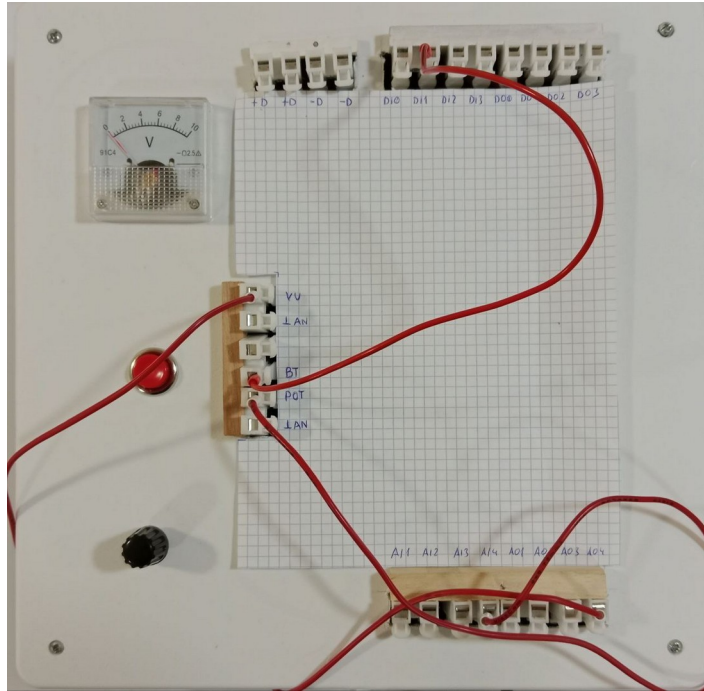


A **programmable logic controller** (PLC) or **programmable controller** is an **industrial computer** that has been **ruggedized** and adapted for the control of manufacturing processes, such as assembly lines, machines, robotic devices, or any activity that **requires high reliability, ease of programming, and process fault diagnosis.**

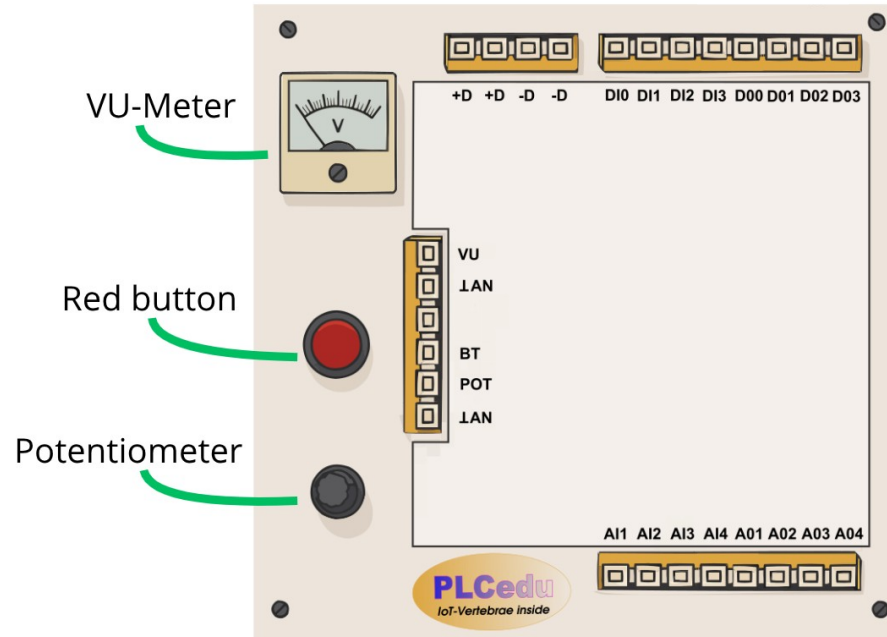


# What is PLCedu?

A basic programmable logic controller (PLC) based on IoT-Vertebrae (Open Source Hardware)



# Glossary



**VU** is VU-Meter input. Analog grounding

**⊥ AN** is analog ground

**BT** is red button output. Digital grounding

**POT** is potentiometer output. Analog grounding

**+D** is 12 volts digital power supply. Digital grounding

**-D** is digital ground

**DI0 .. DI3** are 4 digital inputs. Digital grounding

**DO0 .. DO3** are 4 digital outputs. Digital grounding

**AI1 .. AI4** are 4 analog inputs. Analog grounding

**AO1 .. AO4** are 4 analog outputs. Analog grounding

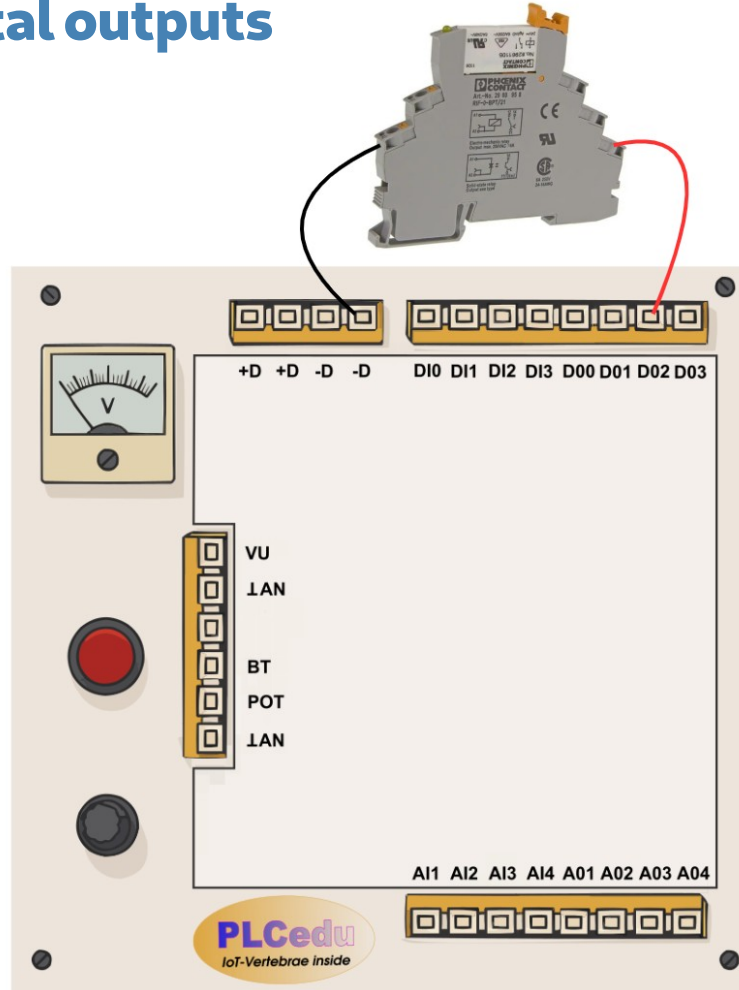
**VU-Meter** reads voltage from 0 to 10 volts. Analog grounding (GND is ⊥ AN)

**Red button** gives 12 volts when pressed (0 otherwise). Digital grounding (GND is -D)

**Potentiometer** output voltage is from 0 to 10 volts. Analog grounding (GND is ⊥ AN)



# Digital outputs



```
dout bits(4) 0100
```

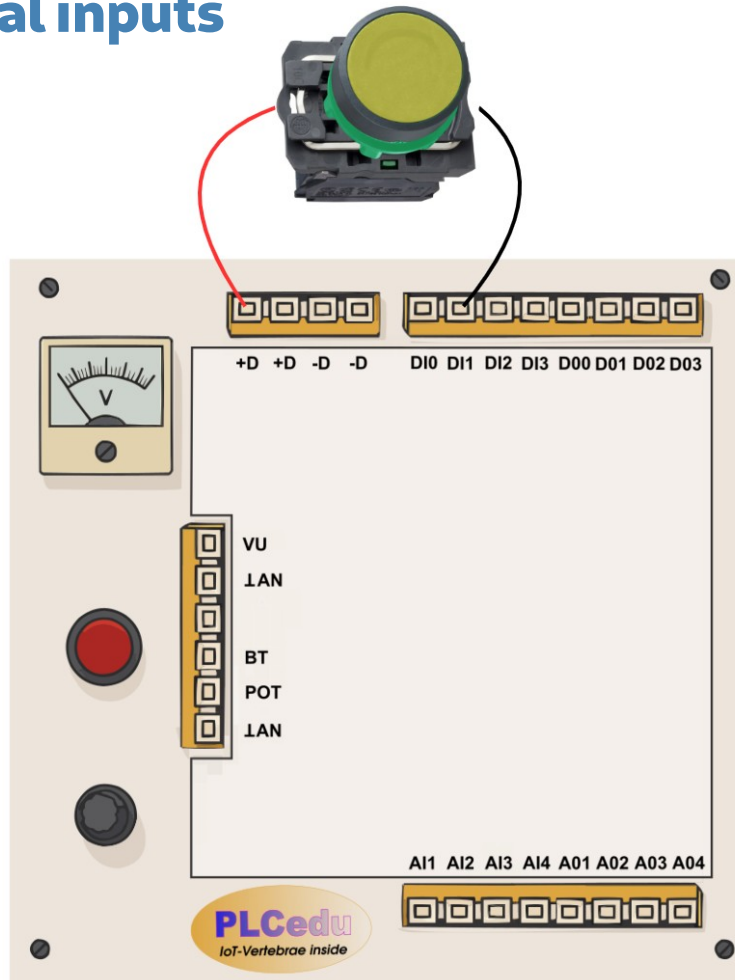
```
dout bits(4) 0000
```

```
doutbit bit(0-3) 2 valor(0-1) 1
```

```
doutbit bit(0-3) 2 valor(0-1) 0
```

```
from plcEdu import *  
import time  
  
dout(0x4) # 0100  
time.sleep(5) # 5 seconds  
dout(0x0) # 0000  
  
from plcEdu import *  
import time  
  
doutbit(2,1)  
time.sleep(5) # 5 seconds  
doutbit(2,0)
```

# Digital inputs



din bits

dinbit bit(0-3) 1

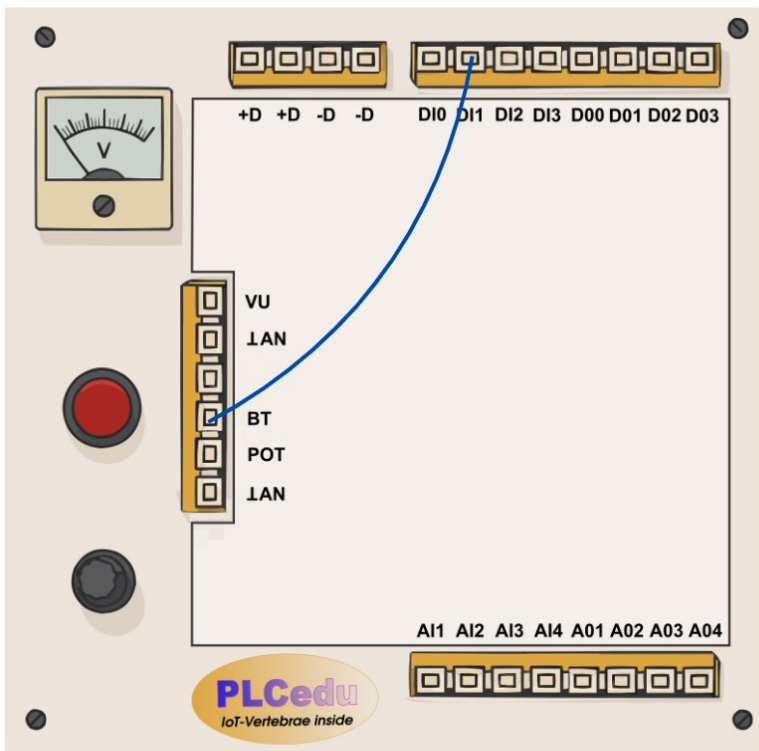
```
from plcEdu import *
```

```
reading = din()  
print("Reading: %s"%reading)
```

```
from plcEdu import *  
import time
```

```
for bit in range(4):  
    readBit = dinbit(bit)  
    print("bit %d: %s"%(bit,readBit))  
    time.sleep(0.1)
```

# Digital inputs



din bits

dinbit bit(0-3) 1

```
from plcEdu import *
```

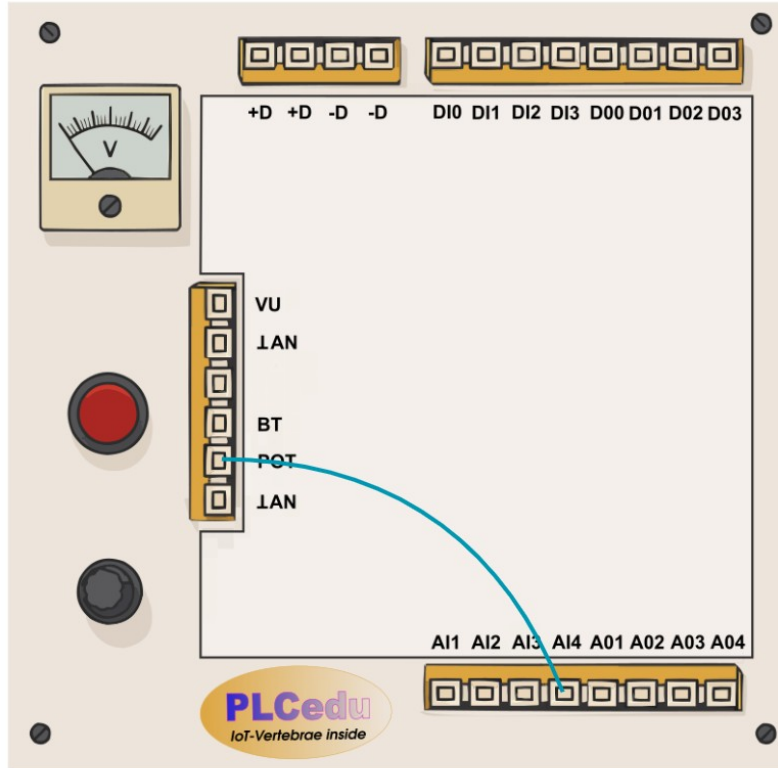
```
reading = din()  
print("Reading: %s"%reading)
```

```
from plcEdu import *  
import time
```

```
for bit in range(4):  
    readBit = dinbit(bit)  
    print("bit %d: %s"%(bit,readBit))  
    time.sleep(0.1)
```

DI1 (digital input 1) is connected to BT (when red button is pressed BT gives 12 volts)

# Analog inputs



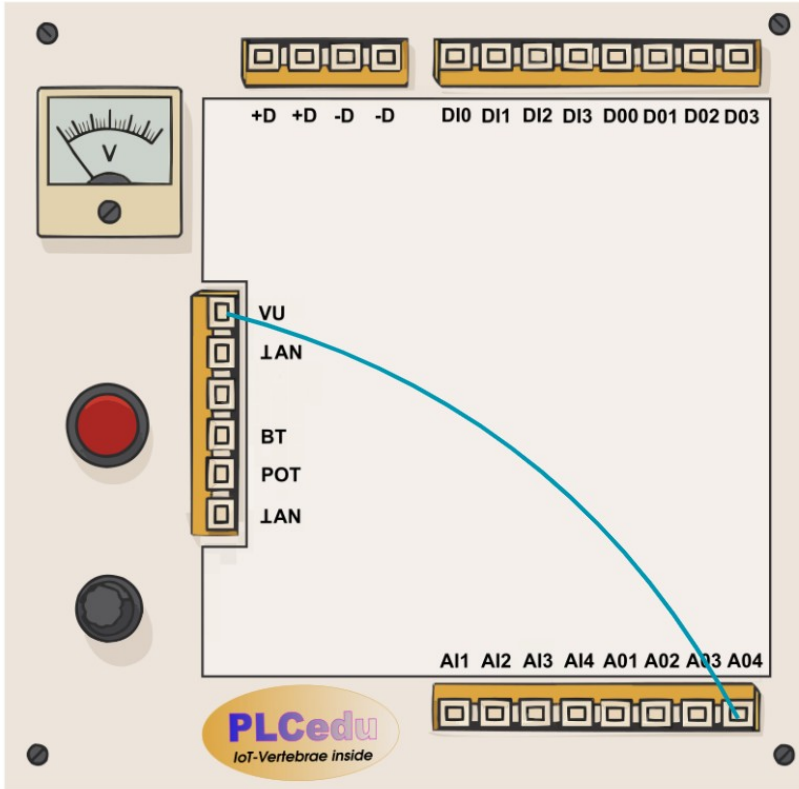
ain canal 4

```
from plcEdu import *  
  
canal = 4  
aVal = ain(canal)  
print("Reading ",aVal," volts at canal ",canal)
```

AI4 (analog input 4) is connected to POT (potentiometer output voltage is from 0 to 10 volts)



# Analog outputs



aout canal 4 valor 0-10 7

```
from plcEdu import *

canal = 4
value = 7.5
aout(canal,value)
print("Sending ", value," volts to channel ", canal)

from plcEdu import *
import time

canal = 4
for value in range(11):
    aout(canal,value)
    print("Sending ", value," volts to channel ", canal)
    time.sleep(0.5)
    if value != 10:
        aout(canal,value+0.5)
        print("Sending ", value+0.5," volts to channel ", canal)
        time.sleep(0.5)
value = 5
aout(canal,value)
print("Sending ", value," volts to channel ", canal)
```

AO4 (analog output 4) is connected to VU (VU-Meter reading from 0 to 10 volts)



how where ? when !  
who how what ! when why  
how who what how why  
**Questions!**  
? ! ? how where who ! how  
who ! why what how when  
? how when ? why ! where !  
! when

# Thank you for watching!

**This presentation on GitHub**

**by Jordi Binefa: [jordibinefa@gmail.com](mailto:jordibinefa@gmail.com)**