Power Meter Monitor

Business and Mission-

Critical Solutions Provider

PMM06 Integration with Scilab

User Manual

Document: Guidelines
Document version: 1.0
Date: October 2022

Contents

1. INTRODUCTION 3
1.1 Description 3
1.2 List of Compatible devices 3
2. INTEGRATION GUIDELINES 4
2.1 Scilab Installation Guidelines 4
3. PMM0625 INTEGRATION with Scilab TUTORIAL 8
3.1 PIN ASSIGNMENTS 8
3.2 HARDWARE CONNECTIONS 9
Connecting Power 9
Connecting Serial Device 9
Connecting to a Host or the Network 9
Connecting Digital Input 9
Connecting the USB 10

1. INTRODUCTION

This Document is a fully descriptive guideline for integrating PMM06 series with Scilab. Providing the operator with the needed information in terms of instructions and screen layout allowing for easy use.

1.1 Description

PMM PLC Systems are built to be Arduino compatible programming environment, where PMM's PLCs Range is not just compatible with Arduino IDE, but with lots of other Arduino-compatible programming software such as Scilab.

Scilab is a free and open-source, cross-platform numerical computational package and a high-level, numerically oriented programming language. It can be used for signal processing, statistical analysis, image enhancement, fluid dynamics simulations, numerical optimization, and modeling, simulation of explicit and implicit dynamical systems and (if the corresponding toolbox is installed) symbolic manipulations.

Scilab is one of the two major open-source alternatives to MATLAB, the other one being GNU Octave. Scilab puts less emphasis on syntactic compatibility with MATLAB than Octave does, but it is similar enough that same authors suggest that it is easy to transfer skills between the two systems

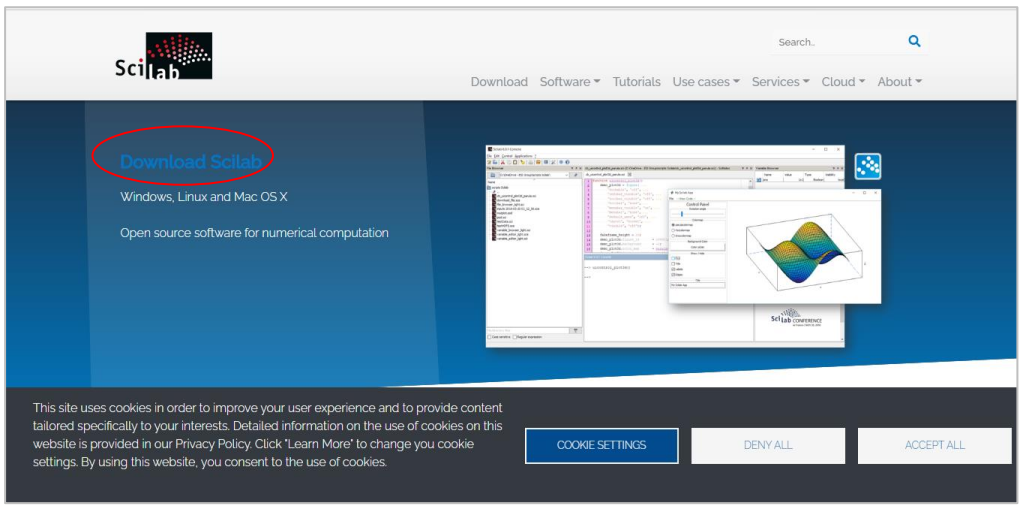
1.2 List of Compatible Devices

- PMM0612
- PMM0620
- PMM0625
- PMM0626
- PMM0627
- PMM0628
- PMM0630
- PMM0631
- PMM0632
- PMM0635
- PMM0636
- PMM0638
- PMM0639

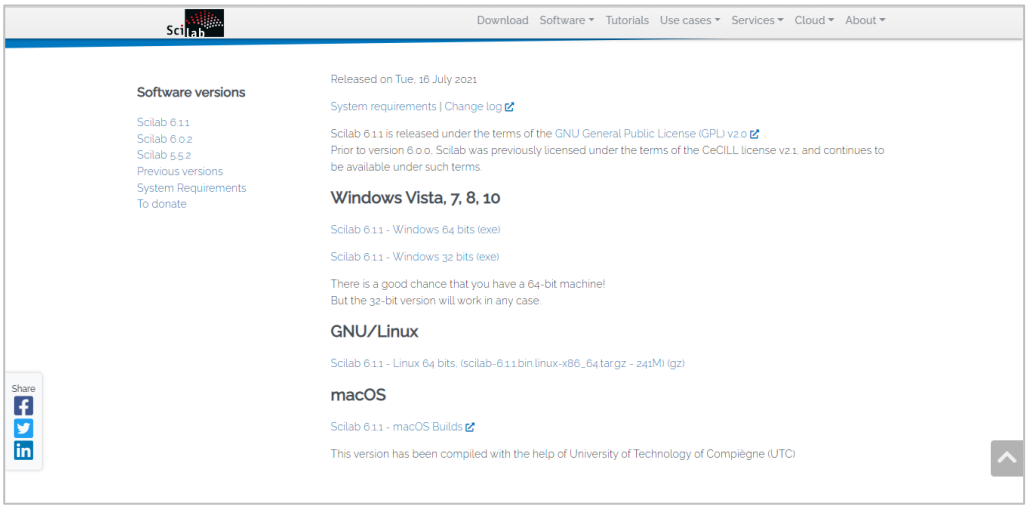
2. INTEGRATION GUIDELINES

2.1 Scilab Installation Guidelines

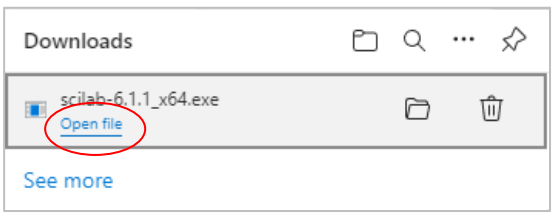
1. Click Here to get to the installation page.
2. Once the main page is opened, click on “Download Scilab”.



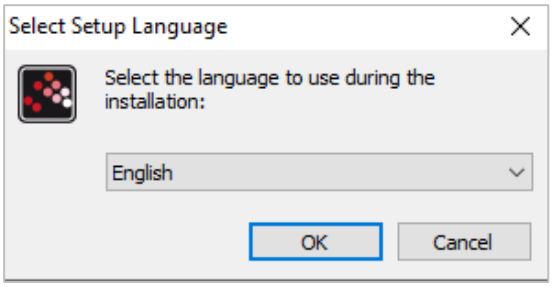
3. Choose the compatible version for your device.



4. Click on “open file” to proceed to installation.

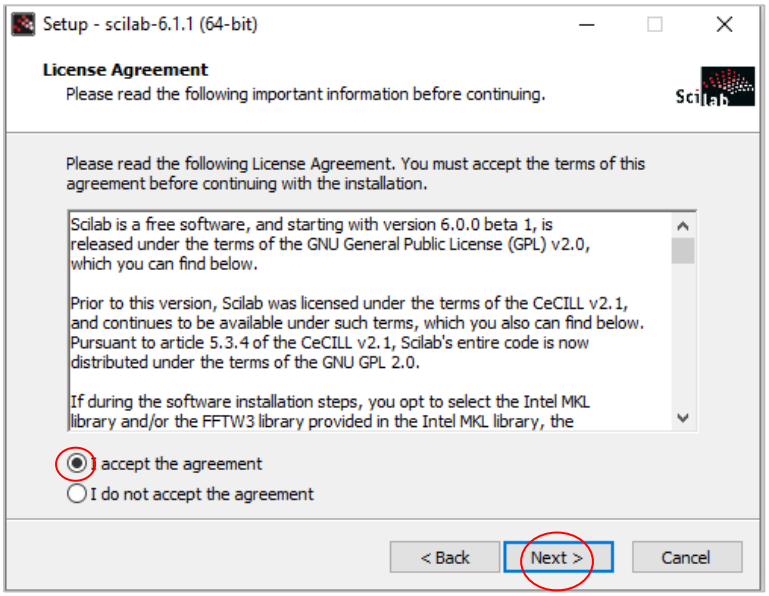


5. Select the desired language during installation> ok.

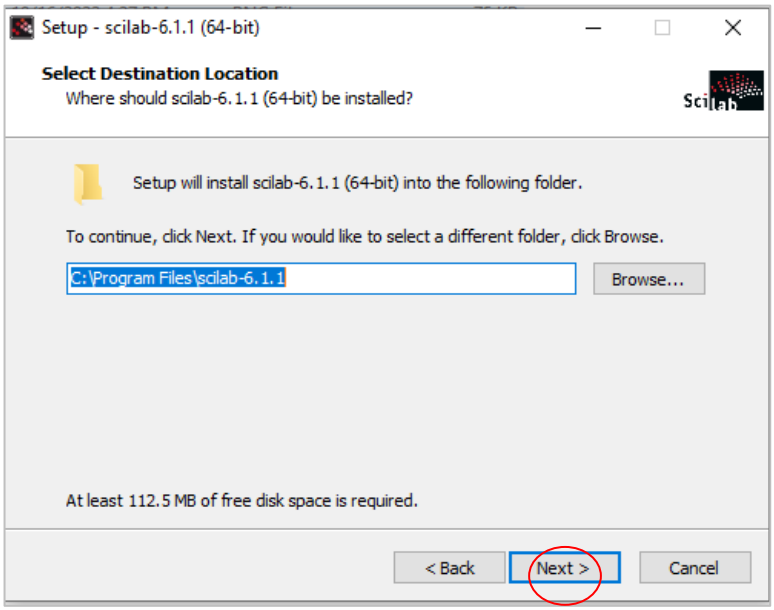


6. Scilab setup process will start, click on “Next” to continue the setup to the completion as shown in the figures below.

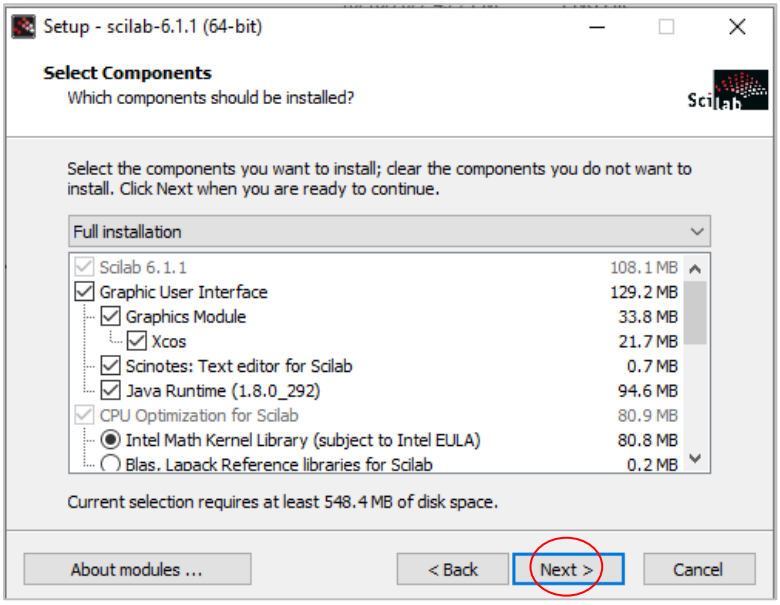
7. Choose” I accept the agreement” and hit next.



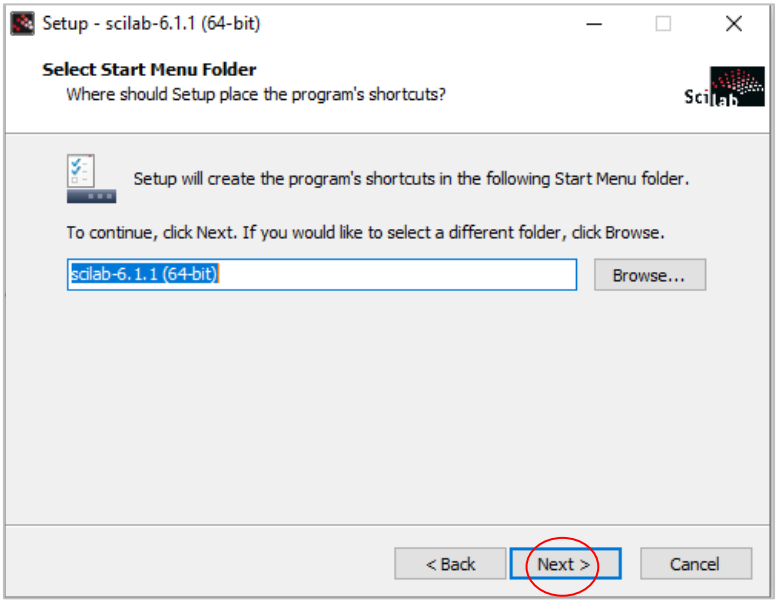
8. Select the desired destination file location and press on “Next”.



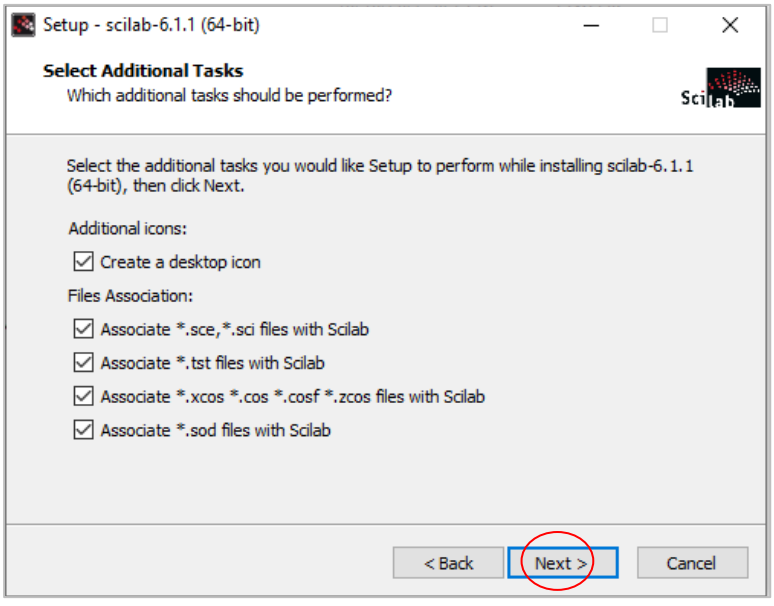
9. Select which components should be installed and press on “Next”.



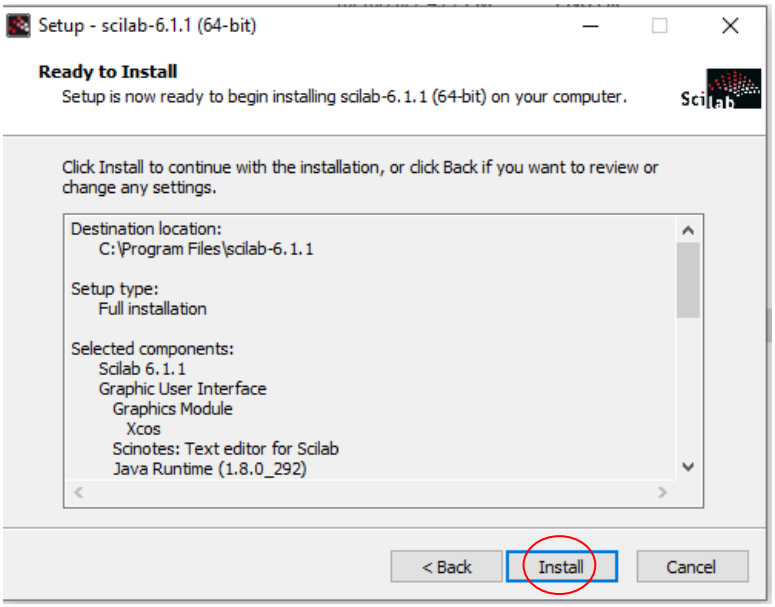
10. Select start menu folder,” where should setup place the program shortcuts?” and press on “Next”.



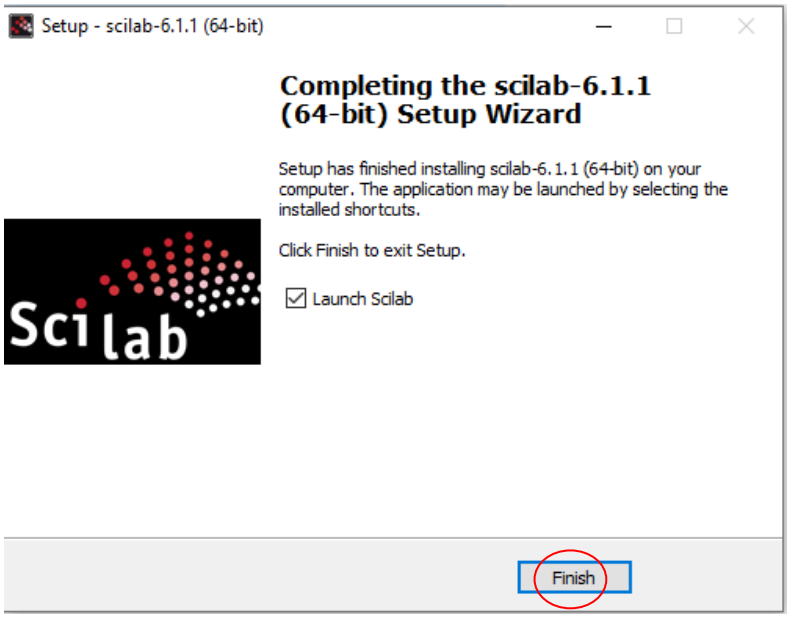
11. Select additional tasks you wish to be preformed and press “Next”.



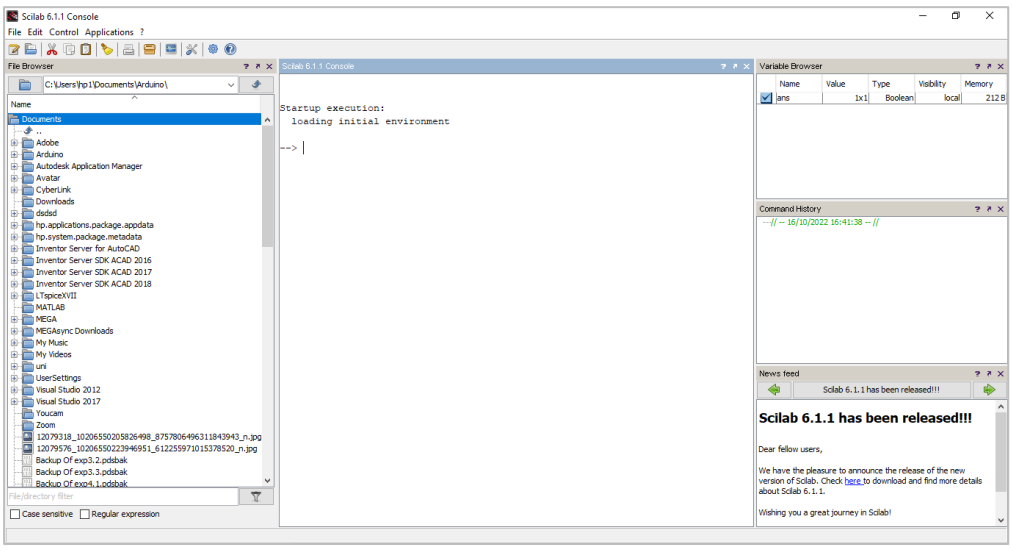
12. Now the program is ready to install, click on the “install” button.



13. Installation is done press on “Finish”.



14. Now everything is setup and the user can start using the program.



3. PMM0625 INTEGRATION with Scilab TUTORIAL

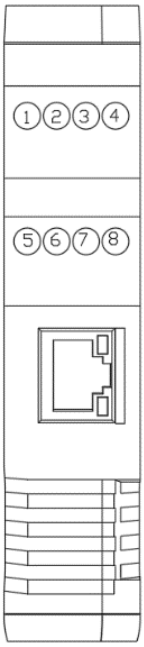
This section is full descriptive of the instructions related to connecting PMM0625 to scilab. PMM0625-T is a reliable digital output module with 8 (80VDC) transistor isolated channels. The module sends digital signals from the CPU to the field actuators controlling their status between on/off. Each output can be individually switched on or off and can handle up to 5A. In addition, the opto-coupled architecture makes each output channel rather rugged, capable of isolating the CPU from transient voltage “spikes” and other electrical phenomena capable of causing damage. PMM0625-T is widely used in signal interface switching of PLC, single chip or other industrial control board.

Moreover, PMM0625-T operates under three operational modes:

- **Modular operation mode**: the module is connected to a PLC by RS485 and implement specific function assigned by the PLC.
- **Fail Safe mode**: the module should be pre-programmed in case of lost connection with the PLC to carry on its function effectively.
- **Stand-alone**: the module can be programmed to work as PLC and control the field devices.

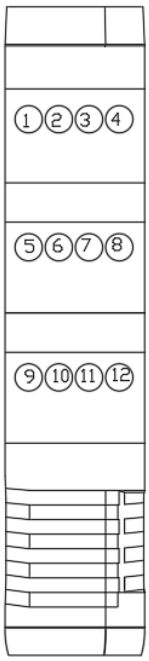
3.1 PIN ASSIGNMENTS

TOP VIEW



1. D+ (RS485)
2. D- (RS485)
3. GND
4. Master command
5. V DC+ (9-56)
6. V DC- (9-56)
7. Earth
8. Earth

BOTTOM VIEW



1. Digital output 01
2. Digital output 02
3. Digital output 03
4. Digital output 04
5. Digital output 05
6. Digital output 06
7. Digital output 07
8. Digital output 08
9. VCC
10. COM1
11. VCC
12. COM 2

3.2 HARDWARE CONNECTIONS

Connecting Power

PMM0625-T has two power supply options 10-60 VDC (10-48 VAC), the user has to connect the positive power line (+) to pin no.5 in the top view and the negative line (-) to pin no.6 as illustrated in the pin's assignments.

Note: the power is protected against overvoltage and reverse polarity in case of wrong connection.

Connecting Serial Device

The unit's serial port is located on the top panel. If you are connecting an RS485 multidrop network with multiple devices, note the following:

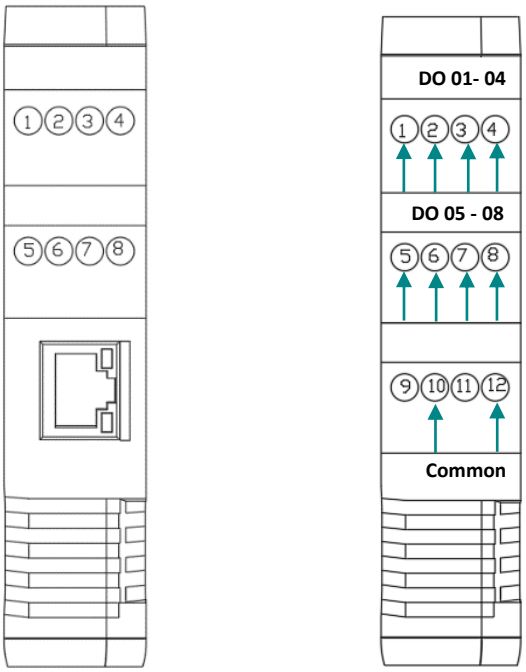
- All devices that are connected to a single serial port must use the same protocol (i.e., either Modbus RTU or Modbus ASCII).
- Connect the D+ with pin no.1 and D- with pin no.2 and Earth with pin no.7 or 8 as illustrated in the pin's assignments to complete the connection successfully.
- Turn on the dip switch to have 120 Ω termination resistor between the D+ and D- lines. Refer hardware configuration section.

Connecting to a Host or the Network

There is a 10/100 Ethernet port at the module's top panel. This port is used to connect the module with a host or Ethernet network.

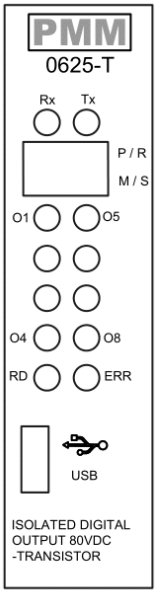
Connecting Digital Input

Connect the signal line with one of the eight digital output pins on the bottom view (01-08) and the common line for digital outputs from (1-4) with pin no.10 and the common line for digital outputs from (5-8) with pin No. 12.



There are 12x LED indicators at the front panel. 2x LED are for communication indication through RS485 and 8x LED for indicating the outputs status.

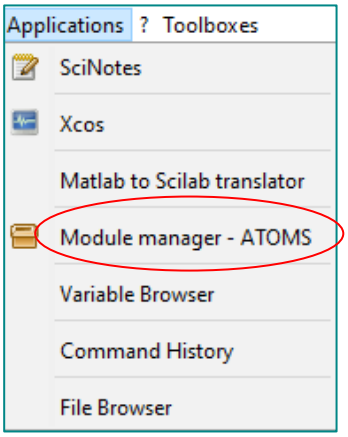
LED No.	Indication
Rx, Tx	Indicating the communication through RS485 por OFF: No Data is being transmitted or received through the port Flickering Green: Data is being transmitted or received through the port
Ox-O8	Indicating the status of Output x OFF: Output x is off Steady-Green: Output x is on



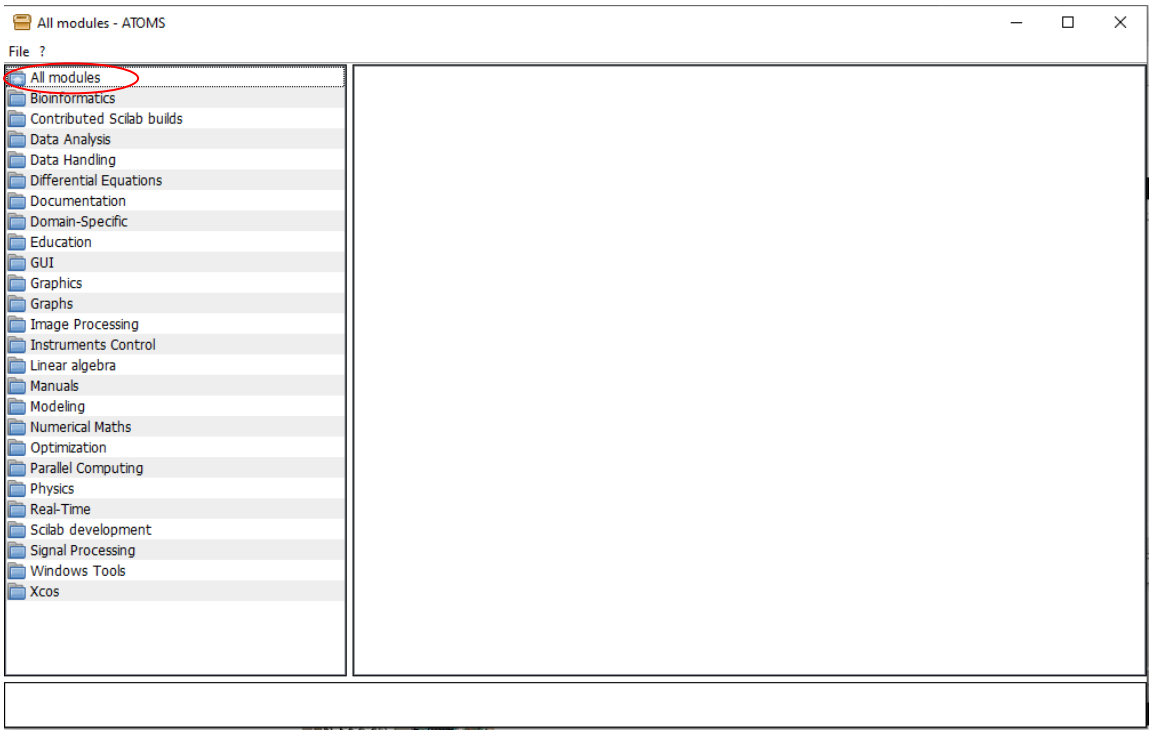
Connecting the USB

Connect the USB to the device through the USB port in the front panel (Micro-USB type), and connect the other side with personal computer (PC). Once the USB is connected correctly between the device and PC, the user can start the integration as explained in the Integration Guidelines:

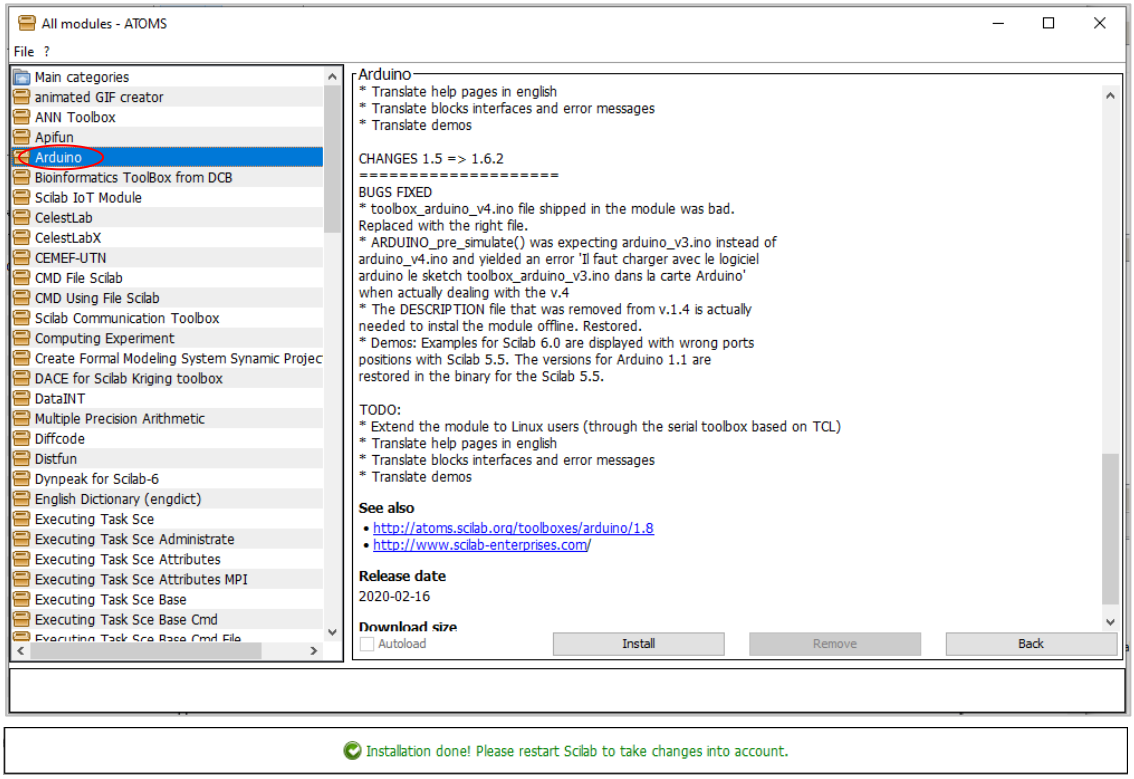
1. To connect our board with Scilab from the tool bar select “applications” then “Module manager-ATOMS”.



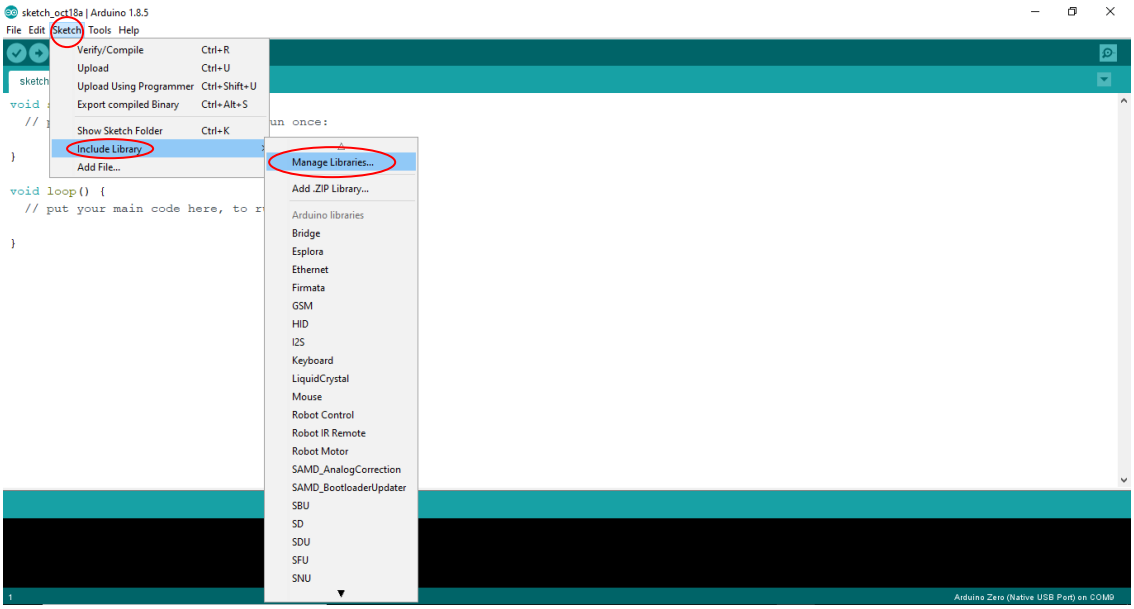
2. Double click on" All modules".



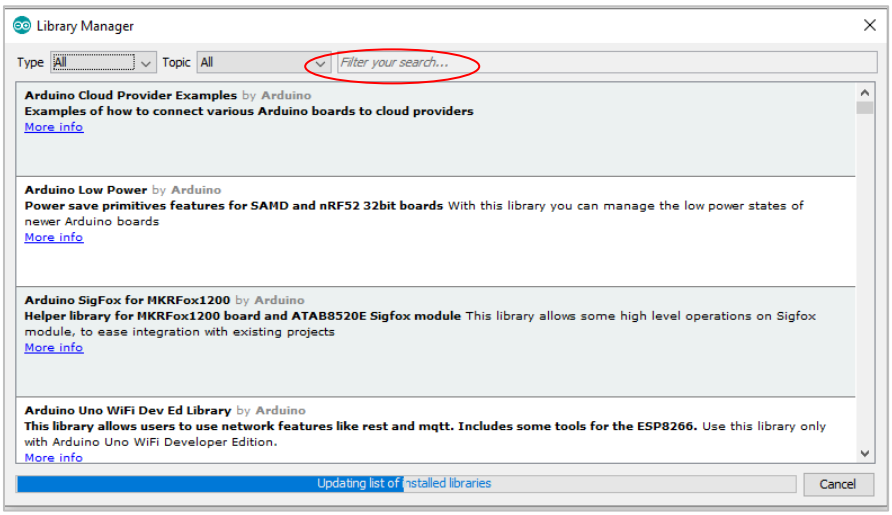
3. Select Arduino and press on" Install".



4. Now open the Arduino app from the tool bar go to “sketch>include library >manage libraries”.

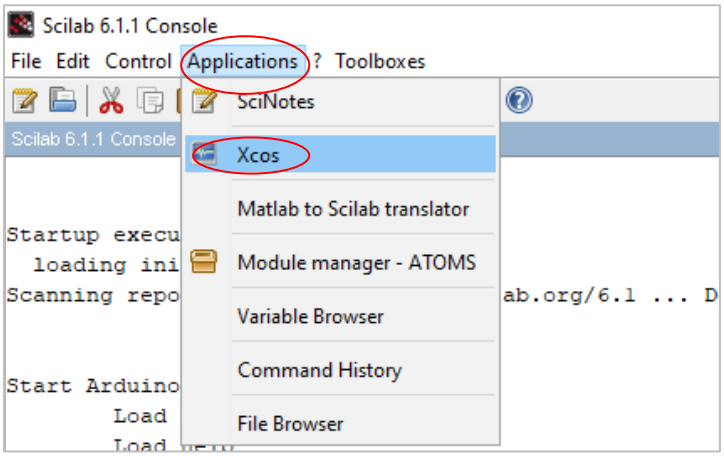


5. Now search for the following libraries (servo.h and mpu6050) and install them.

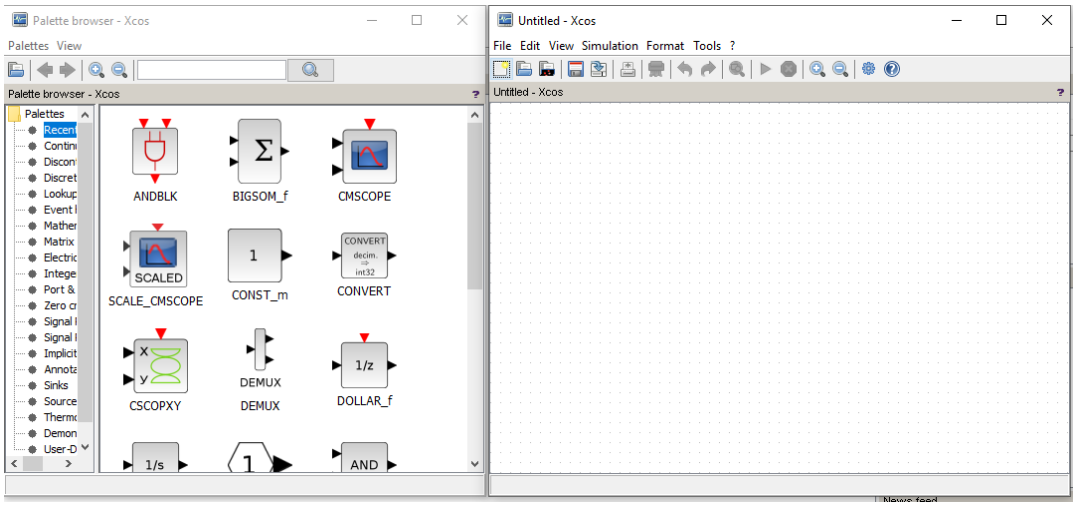


6. Once they are successfully installed, click here then copy the code and compile it on the Arduino app to your device.

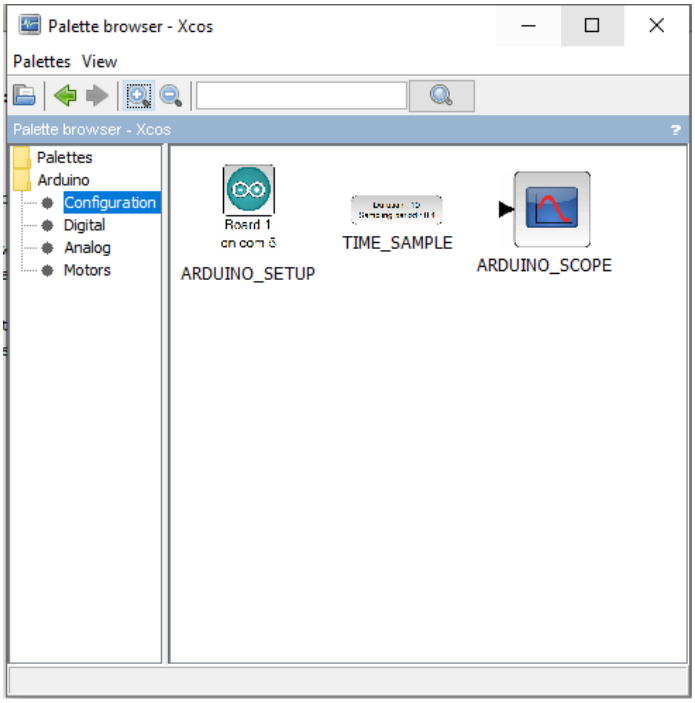
7. Now that the compiling is done go back to Scilab and from the tool box > applications>Xcos.



8. The following pages should be on your screen, to add your circuit.

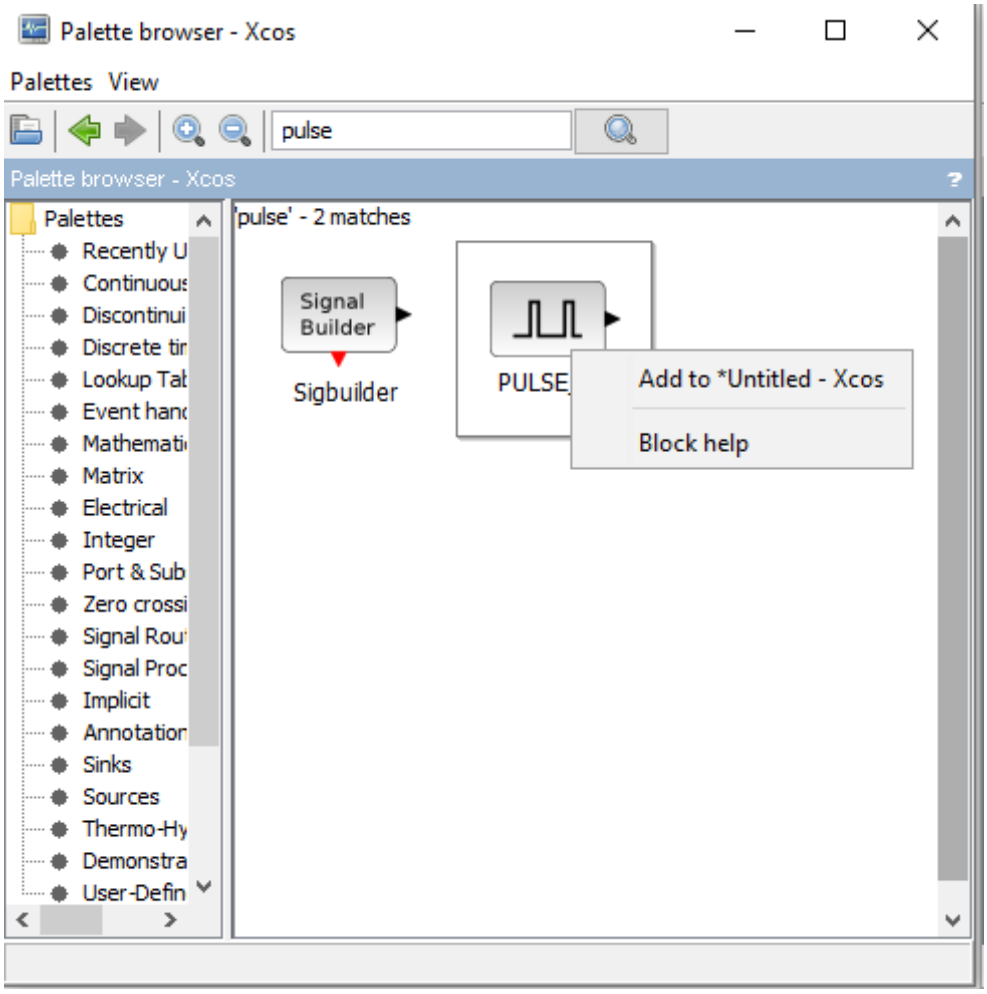


9. To select your desired functions >select Arduino > Arduino setup.
10. to add you board right click on the desired item > “add to untitled-xcos”.

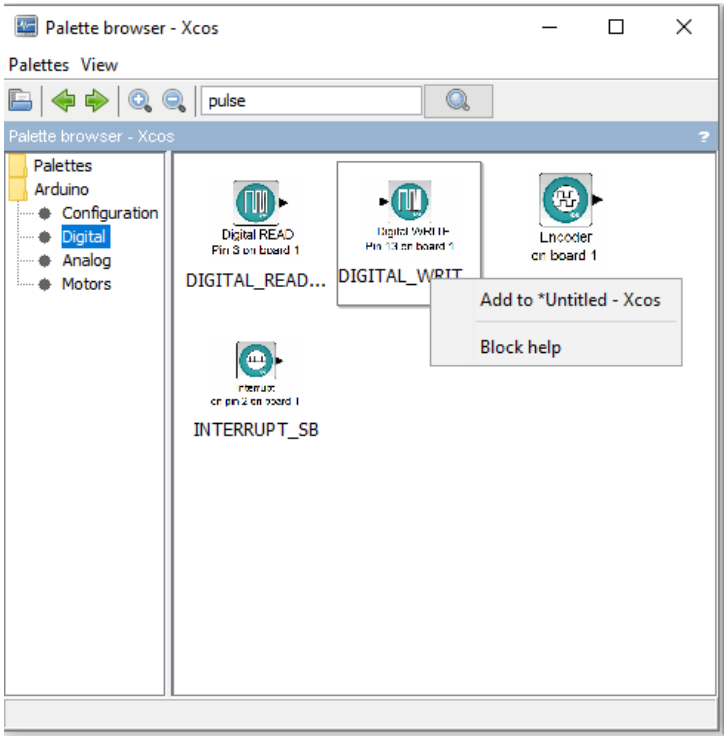


11. From the search option type your desired function .

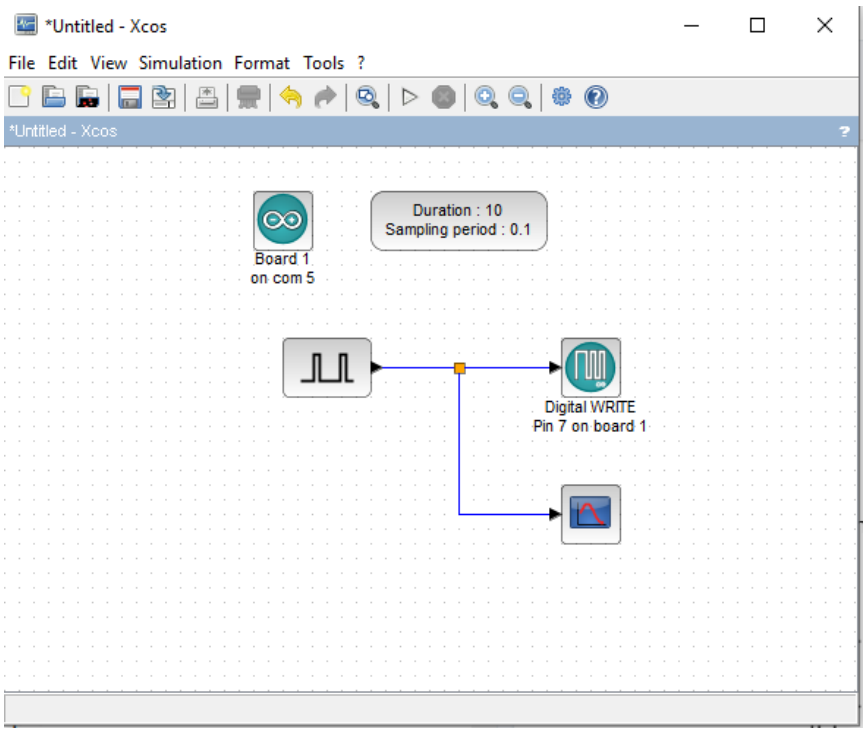
Note: in this example we made a led blink.



12. Do the same for pin options.



13. After adding your functions, double click on each one to edit and connect them by pressing on each item and dragging a line to the other.



14. From simulation > compile >start
And the program should be running