

Power Meter Monitor

Business and Mission-

Critical Solutions Provider

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PMM06 Integration with Scilab







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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 highlevel, 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

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2.1 Scilab Installation Guidelines

- 1. <u>Click Here</u> to get to the installation page.
- 2. Once the main page is opened, click on "Download Scilab".

Scilab	Download Software - Tutorials Use	Search. cases * Services * Cloud	Q • About •
Download Scilato Windows, Linux and Mac OS X Open source software for numerical computation			
This site uses cookies in order to improve your user experience and to pro tailored specifically to your interests. Detailed information on the use of co website is provided in our Privacy Policy. Click "Learn More" to change you settings. By using this website, you consent to the use of cookies.	ookies on this	DENYALL	ACCEPTALL

3. Choose the compatible version for your device.

Scilab	Download Software ▼ Tutorials Use cases ▼ Services ▼ Cloud ▼ About ▼	
Software versions Scilab 6 11 Scilab 6 0 2 Scilab 5 5 2 Previous versions	Released on Tue, 16 July 2021 System requirements Change log 🗹 Scilab 611 is released under the terms of the GNU General Public License (GPL) v2.0 🖉 . Prior to version 6.0.0, Scilab was previously licensed under the terms of the CeCILL license v2.1 and continues to be available under such terms.	
System Requirements To donate	Windows Vista, 7, 8, 10	
	Scilab 611 - Windows 64 bits (exe)	
	Scilab 6.1.1 - Windows 32 bits (exe)	
	There is a good chance that you have a 64-bit machine! But the 32-bit version will work in any case.	
	GNU/Linux	
	Scilab 611 - Linux 64 bits, (scilab-611bin linux-x86_64targz - 241M) (gz)	
Share f	macOS	
5	Scilab 611 - macOS Builds 😰	
in	This version has been compiled with the help of University of Technology of Compilegne (UTC)	

4. Click on "open file" to proceed to installation.

Downloads	Đ	Q	… ☆
scilab-6.1.1_x64.exe		D	⑪
See more			

5. Select the desired language during installation> ok.

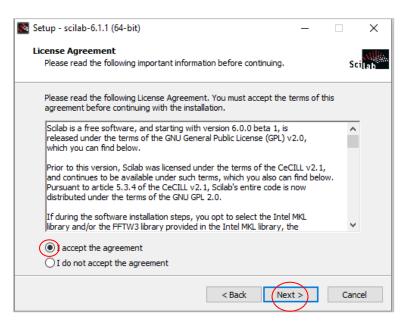
Select Se	etup Language	\times
	Select the language to use during the installation:	
	English	\sim
	OK Cancel	



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".

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

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Setup - scilab-6.1.1 (64-bit)	_		×
Select Components			
Which components should be installed?		S	cilab
Select the components you want to install; clear the components yo install. Click Next when you are ready to continue.	u do not v	vant to	
Full installation			~
Scilab 6.1.1	108.	1 MB /	
Graphic User Interface	129,	2 MB	
··· 🗹 Graphics Module	33.	8 MB	
Kana Kana Kana Kana Kana Kana Kana Kana	21.	7 MB	
	0.	7 MB	
🦾 🗹 Java Runtime (1.8.0_292)	94.	6 MB	
CPU Optimization for Scilab	80.	9 MB	
 Intel Math Kernel Library (subject to Intel EULA) 		8 MB	
Blas. Lapack Reference libraries for Scilab	0.	2 MB	·
Current selection requires at least 548.4 MB of disk space.			
About modules < Back Nex	t >	Ca	ncel

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

3	Setup - scilab-6.1.1 (64-bit)	_		×
	Select Start Menu Folder Where should Setup place the program's shortcuts?		s	cilab
	Setup will create the program's shortcuts in the following Star	t Menu	ı folder.	
	To continue, click Next. If you would like to select a different folder, cl	ck Brov	wse.	
	scilab-6.1.1 (64-bit)	Bro	wse	
	< Back Next :		Car	ncel

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

Setup - scilab-6.1.1 (64-bit)		-		×
Select Additional Tasks				
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Select the additional tasks you would like Setup to perfor (64-bit), then click Next.	m while inst	alling sci	lab-6.1.1	
Additional icons:				
Create a desktop icon				
Files Association:				
Associate *.sce, *.sci files with Scilab				
Associate *.tst files with Scilab				
Associate *.xcos *.cos *.cosf *.zcos files with Scilab	J			
Associate *.sod files with Scilab				
< Back	Next	t >)	Can	icel

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

Setup - scilab-6.1.1 (64-bit)	_		×
Ready to Install Setup is now ready to begin installing scilab-6.1.1 (64-bit) on your co	mputer.	Sci	alab
Click Install to continue with the installation, or click Back if you want change any settings.	to reviev	vor	
Destination location: C:\Program Files\scilab-6.1.1		^	
Setup type: Full installation			
Selected components: Scilab 6.1.1 Graphic User Interface Graphics Module Xcos Scinotes: Text editor for Scilab			
Java Runtime (1.8.0_292) <		> *	
< Back Inst	all	Canc	el

13. Installation is done press on "Finish".



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

Scilab 6.1.1 Console			-	٥	×
File Edit Control Applications ?					
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Inventor Server SDK ACAD 2017					
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Backup Of exp3.2.pdsbak		Dear fellow users,			
Backup Of exp3.3.pdsbak		We have the pleasure to ann	sunce the release of t	he new	
Backup Of exp4. 1. odsbak		version of Scilab. Check here	to download and find	more details	
Fie/directory filter		about Scilab 6.1.1.			
Case sensitive Regular expression		Wishing you a great journey i	n Scilab!		~



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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.



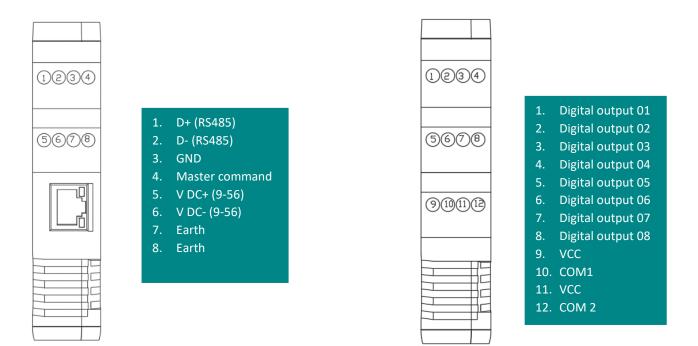
Moreover, PMM0625-T operates under three operational modes:

- **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

BOTTOM VIEW



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:

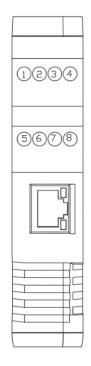
- All devices that are connected to a single serial port must use the same protocol (i.e., either Modbus RTU or Modbus ASCII).
- Connect the D+ with pin no.1 and D- with pin no.2 and Earth with pin no.7 or 8 as illustrated in the pin's assignments to complete the connection successfully.
- Turn on the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

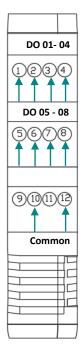
Connecting to a Host or the Network

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

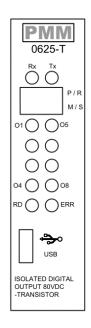
Connect the signal line with one of the eight digital output pins on the bottom view (01-08) and the common line for digital outputs from (1-4) with pin no.10 and the common line for digital outputs from (5-8) with pin No. 12.





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-08	Indicating the status of Output x OFF: Output x is off Steady-Green: Output x is on

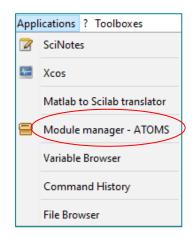


Connecting the USB

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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".



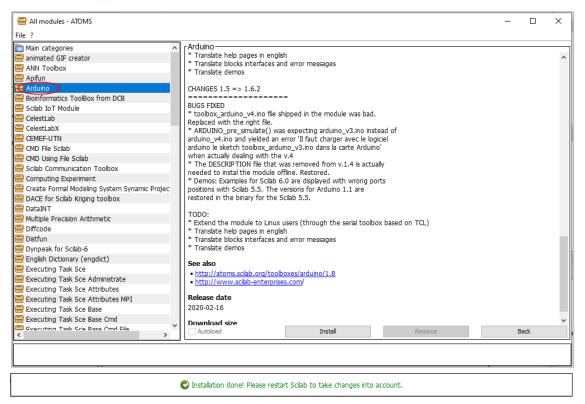


2. Double click on" All modules".

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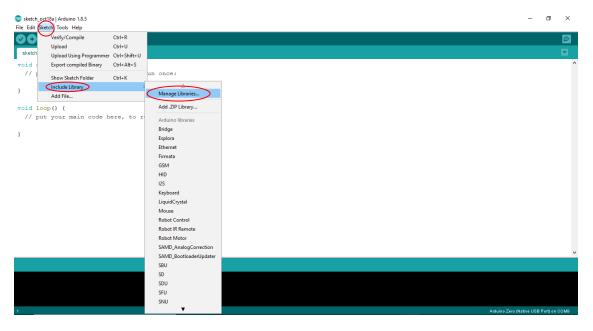
🚍 All modules - ATOMS	-
File ?	
All modules	
Bioinformatics	
🛅 Contributed Scilab builds	
🛅 Data Analysis	
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Documentation	
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3. Select Arduino and press on" Install".





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.

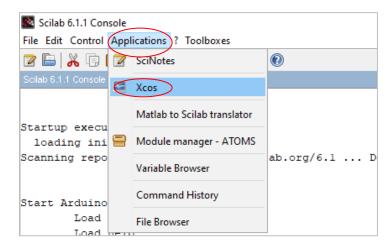
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Type All V Topic All	
Arduino Cloud Provider Examples by Arduino Examples of how to connect various Arduino boards to cloud providers More info	^
Arduino Low Power by Arduino Power save primitives features for SAMD and nRF52 32bit boards With this library you can manage the low power states of newer Arduino boards More info	-
Arduino SigFox for MKRFox1200 by Arduino Helper library for MKRFox1200 board and ATAB8520E Sigfox module This library allows some high level operations on Sigfox module, to ease integration with existing projects More info	-
Arduino Uno WiFi Dev Ed Library by Arduino This library allows users to use network features like rest and mqtt. Includes some tools for the ESP8266. Use this library only with Arduino Uno WiFi Developer Edition. More info	•
Updating list of installed libraries Cance	2l

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

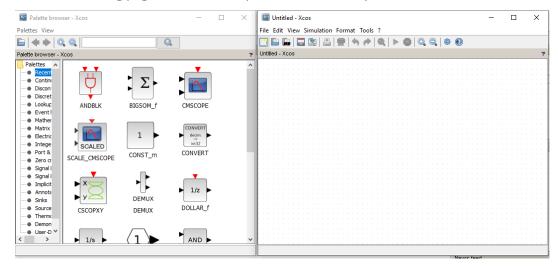




7. Now that the compiling is done go back to Scilab and from the tool box > applications>Xcos.



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".

Palette browser - Xcos			-		×
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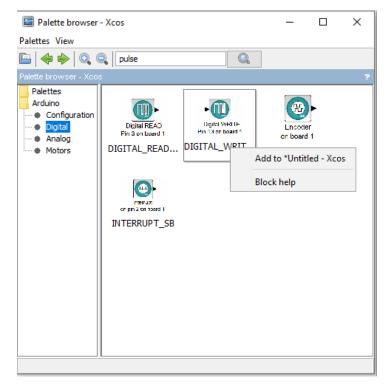
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11. From the search option type your desired function . Note: in this example we made a led blink.

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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.

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File Edit View Simulation Format Tools ?		
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14. From simulation > compile >start And the program should be running

🔤 *Untitled - Xcos	—	×
File Edit View Simulation Format Tools ?		
📑 🔚 🔚 Setup		
*Untitled - Xcos Execution trace and Debug		?
Set Context		
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Start Compile		
Stop		
Digital WRITE		
Pin 9 on board 1		
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