

Power Meter Monitor

Business and Mission-

Critical Solutions Provider

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PMM06 Integration with MICROCHIP Studio

User Manual





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www.Pmm-usa.us

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1. INTRODUCTION

This Document is a fully descriptive guideline for integrating PMM06 series with MICROCHIP Studio. 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 visual studio.

MICROCHIP Studio is an Integrated Development Environment (IDE) for writing and debugging AVR[®] /ARM[®] applications in Windows[®] XP/Windows Vista[®] / Windows 7/8 environments.

MICROCHIP Studio provides a project management tool, source file editor, simulator, assembler, and front-end for C/C++, programming, and on-chip debugging. MICROCHIP Studio supports the complete range of Atmel AVR tools. Each new release contains the latest updates for the tools as well as support for new AVR/ARM devices.

MICROCHIP Studio has a modular architecture, which allows interaction with 3rd party software vendors. GUI plugins and other modules can be written and hooked to the system. Contact Atmel for more information.

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 MICROCHIP Studio Installation Guidelines

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

MICROCHIP Products Solutions Tools and Resources Support	Education	About Order	Now Q	ы К Г	
Tools and Resources / Develop / Microchip Studio for AVR® and SAM Devices					
Key Features Getting Started Downloads					
Microchip Studio is an Integrated Development Environment (IDE) for developing and debugging AVR [®] and SAM microcontroller applications. It merges all of the great features and functionality of Atmel Studio into Microchip's well-supported portfolio of development tools to give you a seamless and easy-to-use environment for writing, building and debugging your applications written in C/C++ or assembly code. Microchip Studio can also import your Arduino [®] sketches as C++ projects to provide you with a simple transition path from makerspace to marketplace. You can use Microchip Studio with the debuggers, programmers and development kits that support AVR and SAM devices. Extend your development environment with Microchip Gallery, an online app store for Microchip Studio plug-ins developed by Microchip as well as third-party tool and embedded software vendors. Even though it comes with a new name and look, you will still be able to use any existing documentation and videos about Atmel Studio to learn how to use Microchip Studio.					

3. Click on "Download" (offline Installer) to install the Microchip studio installer.

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Tools and Resources / Develop / Microchip Studio for AVR® and SAM Devices			
Key Features Getting Started Downloads			
Downloads and Documents			
Downloads	Documentation		
Download Microchip Studio			
\$ Title	Version Number	Date	Download
Title Microchip Studio for AVR and SAM Devices- Offline Installer	Version Number 7.0.2594	Date 20 Jun 2022	Download
Title Microchip Studio for AVR and SAM Devices- Offline Installer Microchip Studio for AVR and SAM Devices- Web Installer	Version Number 7.0.2594 7.0.2594	Date 20 Jun 2022 20 Jun 2022	Download Download Download
Title Microchip Studio for AVR and SAM Devices- Offline Installer Microchip Studio for AVR and SAM Devices- Web Installer Release Notes	Version Number 7.0.2594 7.0.2594	Date 20 Jun 2022 20 Jun 2022	Download Download Download



4. Microchip installation process will start, click on "I agree" then "Next" to continue.



5. Click on "Next" to continue.

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Microchip Studio for AVR and SAM Devices $_$ \times
Microchip Studio
Select Architecture
✓ AVR
✓ UC3
SAM
Back Next Cancel

6. Click on "Next" to continue.





7. Click on "Next" to continue.

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8. Press on "Install" to start the installation.

Microchip Studio for AVR and SAM Devices $_$ \scriptstyle
Microchip Studio
Release Notes
Microchip Studio supports MPLAB® XC8 C Compiler for AVR® devices.
Upgrade to PRO license to unlock the full potential of MPLAB® XC8 C compiler's advanced-level optimizations.
More information
Back Install Cancel

9. The MPLAB compiler will pop up, press on "Next" to proceed.





10. Choose "I accept the agreement" then click on "Next".

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License Agreement			li G	MPLAB
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NON-EXCLUSIVE SOFTWARE LICENSE AG This Nonexclusive Software Licens contract between you, your heirs, ("Licensee") and Microchip Techno	REEMENT FOR ME e Agreement (" successors ar logy Incorpora	PLAB® XC8 C "Agreement") nd assigns ated, a Dela	COMPIL: is a aware	ER
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12. Choose where you want your compiler to be installed, then click on "Next".

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Installation Directory	m Files\Micro	chip\xc8\v2.36			
stal Builder					
istanbanaci	11		10	1180	



13. Choose the compiler's settings, then click on "Next".

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14. Now it is ready to be installed click on "Next" to proceed.

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Setup is now ready to begin installing MPLAB X	C8 C Compiler o	n your com	puter.	
InstallBuilder				
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15. Click on "Next" and set up should be complete.

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If you want to use the FREE MPLAB XC8 C Compiler, Click Next. If your Compiler is already licensed, Click Next.			
Click to purchase a PRO license			
Click here to get a free, 60-day evaluation of PRO			
If you have an Activation Key:			
Click here to activate your license			
Your Host ID is: 1cb72cef4662			
InstallBuilder			
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16. Now everything is set up and microchip studio installation is completed.





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18. You will also need to install Arduino IDE. <u>click here</u> to go to download link, and select the suitable download option.

PROFESSIONAL	EDUCATION	STORE		Q Search on Arduino.cc		SIGN IN
ΘO			HARDWARE SOFTWARE CLOUD DOCUMENTATION + COMMUNITY + BLOG ABOUT			
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https://www.arduino.cc/	рго		Nightly Builds Download a preview of the incoming release with the most updated features and bugfixes. Windows macOS venden 01.44: "https://download.com/	(() н	elp

19. Press on "I Agree" to setup.

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20. Choose the installation option and click on "Next".



21. Choose installation folder and click on "Next".

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22. Now that the app is installed the following page will open.



23. To install the boards, go to tools>board> board manager.



24. The board manager will open, search for the Arduino SAMD boards and install it.



25. You will be able to choose the board type and the port from the menu >tools.

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	Serial Plotter	Ctrl+Shift+L
roid loop() {	WiFi101 / WiFiNINA Firmware Updater	
// put your	Board: "Arduino Zero (Programming Port)	•
	Port: "COM4"	
	Get Board Info	
	Programmer	
	Burn Bootloader	

26. Now that all is set up, the start page will open and you can proceed with your project.

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Open Project	Getting started with AVR development		
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3. PMM0625 INTEGRATION with MICROCHIP Studio TUTORIAL

This section is full descriptive of the instructions related to connecting PMM0625 to Visual Studio. 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





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.



BOTTOM VIEW

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 Output

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 port 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. First you will have to install the Arduino IDE for Microchip and Atmel Studio from the menu>tools>extensions and updates.



2. Download the Arduino IDE for Microchip and Atmel Studio.

Extensions and Updates							?	×
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3. Name your project and select desired location.





4. Specify a micro controller IDE location.

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Configu	re IDE Locations								
Vin	Please specify a micro-controller IDE location								
	Visual Micro needs to know where, on your computer, application(s) such as the Arduino.exe are located (note: windows store versions are not supported).								
	If an application is not already installed note: The windows store version of the	d then please download it using the 'Download/I e Arduino IDE is NOT supported. Please install it fi	nstall' button. rom the arduino.cc web site.						
	Arduino 1.6/1.8 Use installed IDE (hardware, reference/help + libraries)								
	This location has been automatically discovered. Please ensure that it is correct?								
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	Optional sketchbook location (best to leave empty, also affects the location of libraries/hardware)								
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5. To create a new project, start>new project.

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9. Now type your code and build it.

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10. Now the program should be running.