Power Meter Monitor

Business and Mission-

Critical Solutions Provider

PMM06 Integration with MICROCHIP Studio

User Manual

Document: Guidelines
Document version: 1.0
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Contents

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.

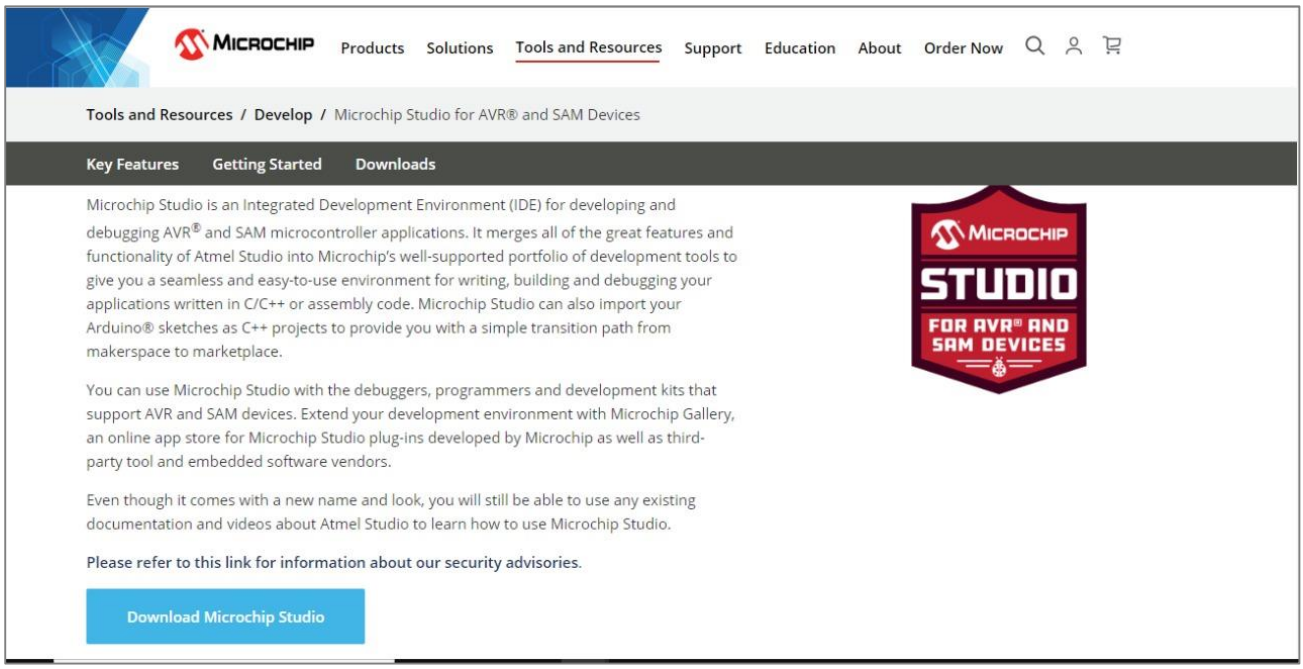
1.2 List of Compatible devices

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

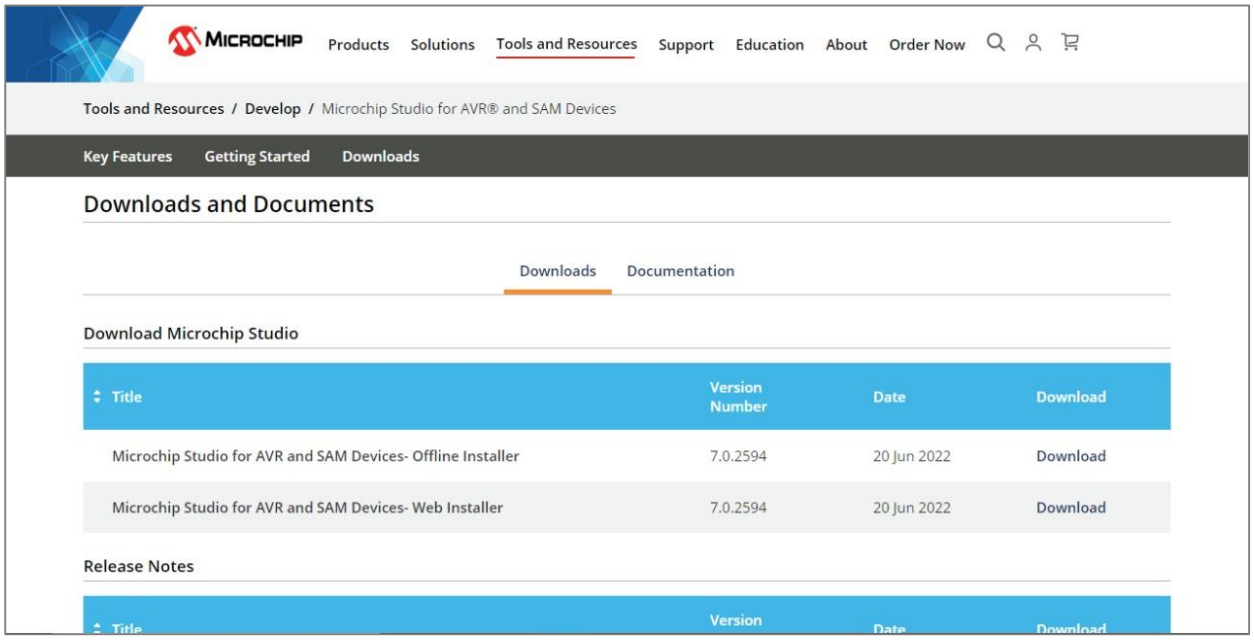
2. INTEGRATION GUIDELINES

2.1 MICROCHIP Studio Installation Guidelines

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

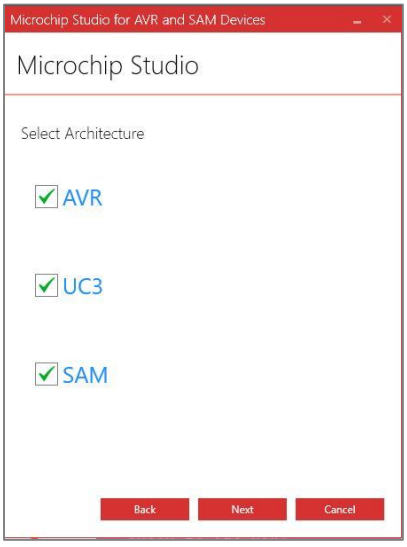


3. Click on “Download” (offline Installer) to install the Microchip studio installer.



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

5. Click on “Next” to continue.



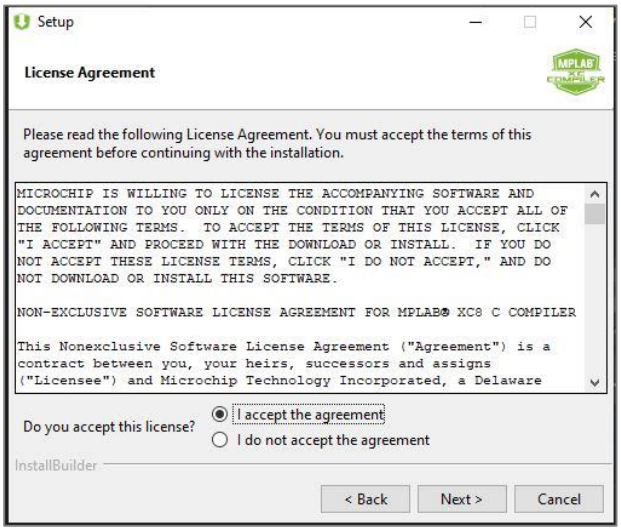
6. Click on “Next” to continue.

7. Click on “Next” to continue.

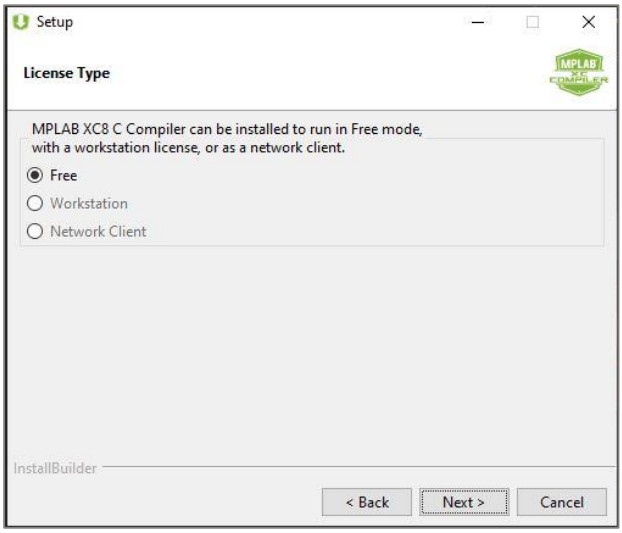
8. Press on “Install” to start the installation.

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

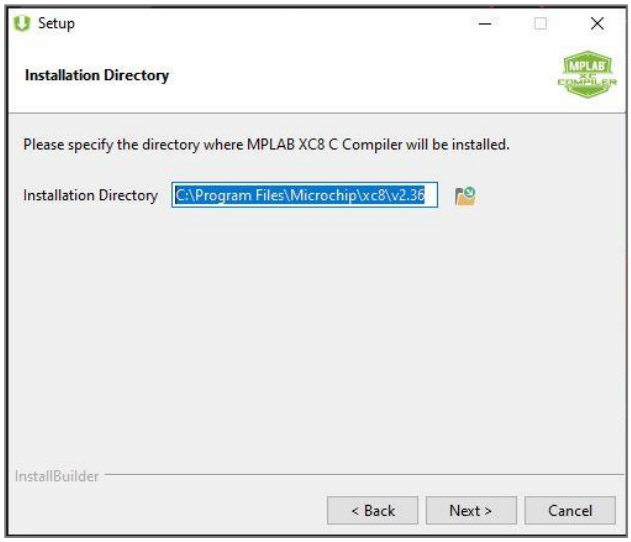
10. Choose “I accept the agreement” then click on “Next”.



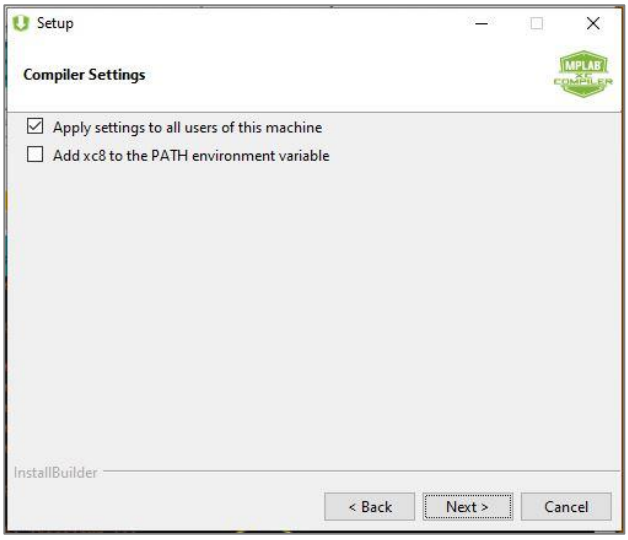
11. Choose your license type and click on “Next”.



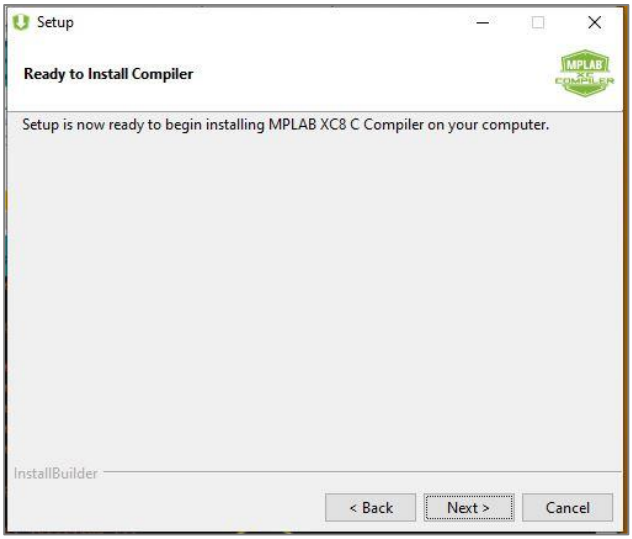
12. Choose where you want your compiler to be installed, then click on “Next”.



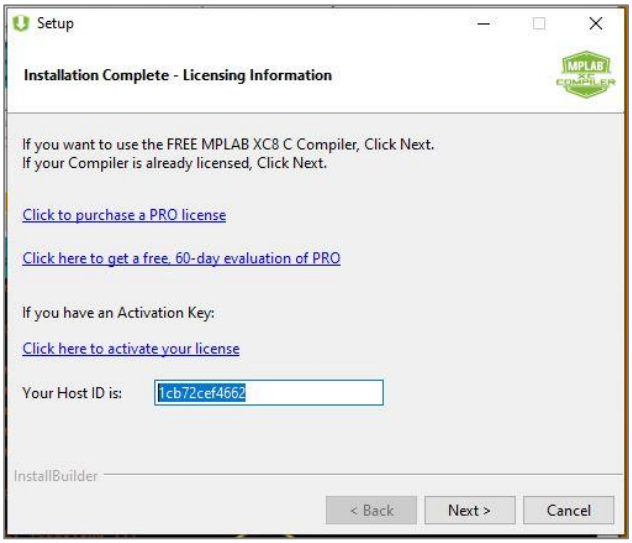
13. Choose the compiler's settings, then click on "Next".



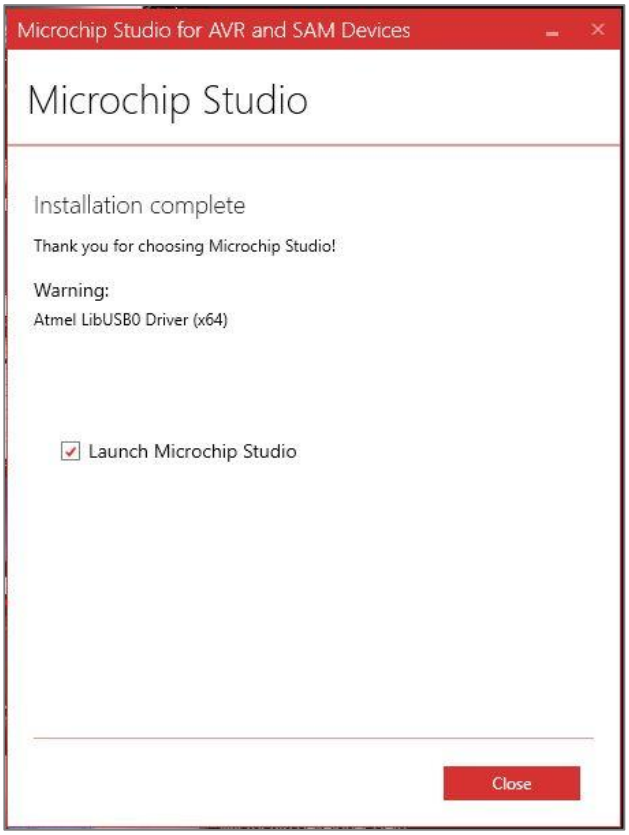
14. Now it is ready to be installed click on "Next" to proceed.



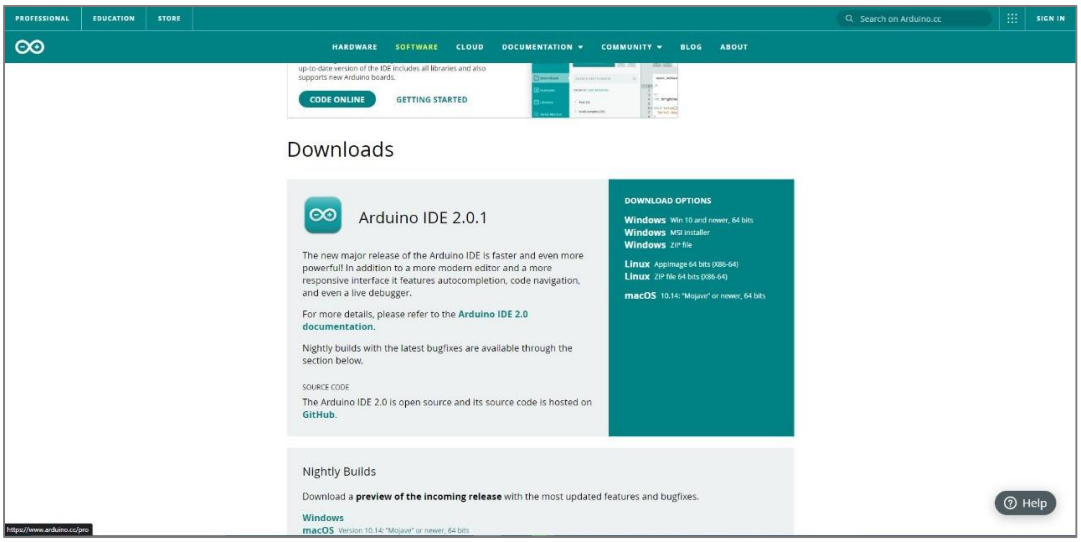
15. Click on "Next" and set up should be complete.



16. Now everything is set up and microchip studio installation is completed.

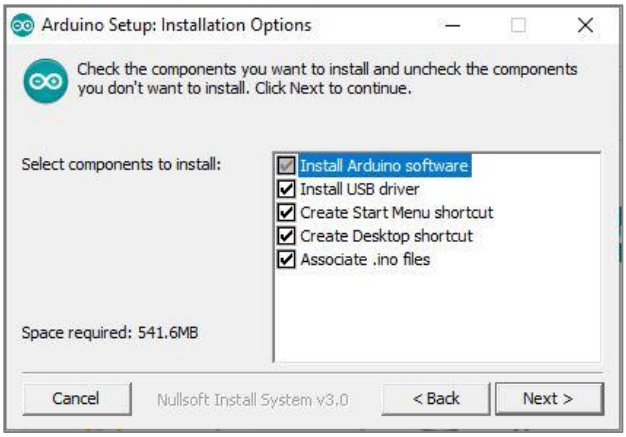


18. You will also need to install Arduino IDE. click here to go to download link, and select the suitable download option.

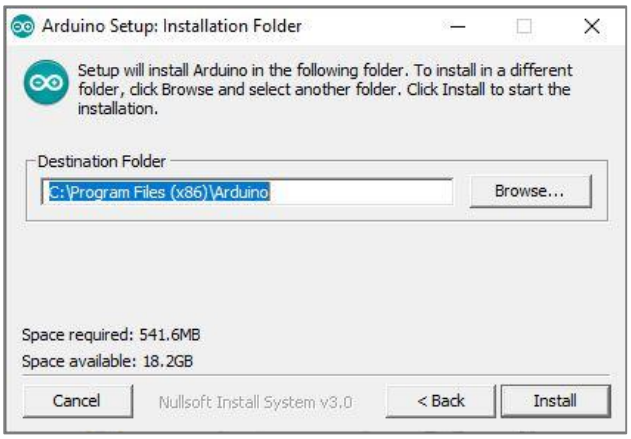


19. Press on “I Agree” to setup.

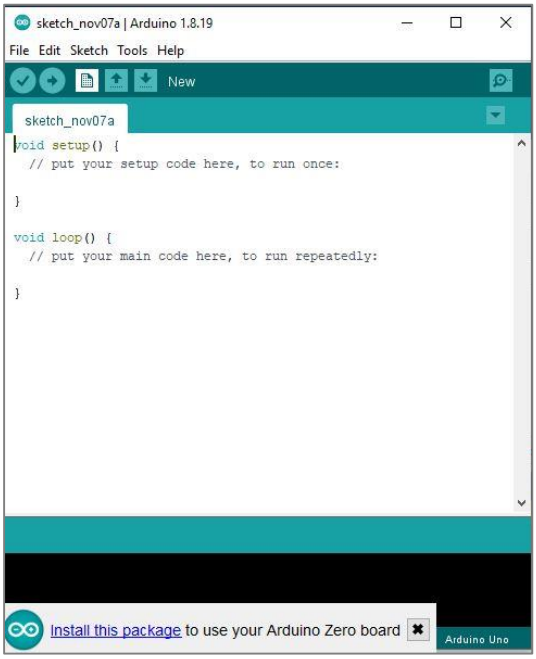
20. Choose the installation option and click on “Next”.



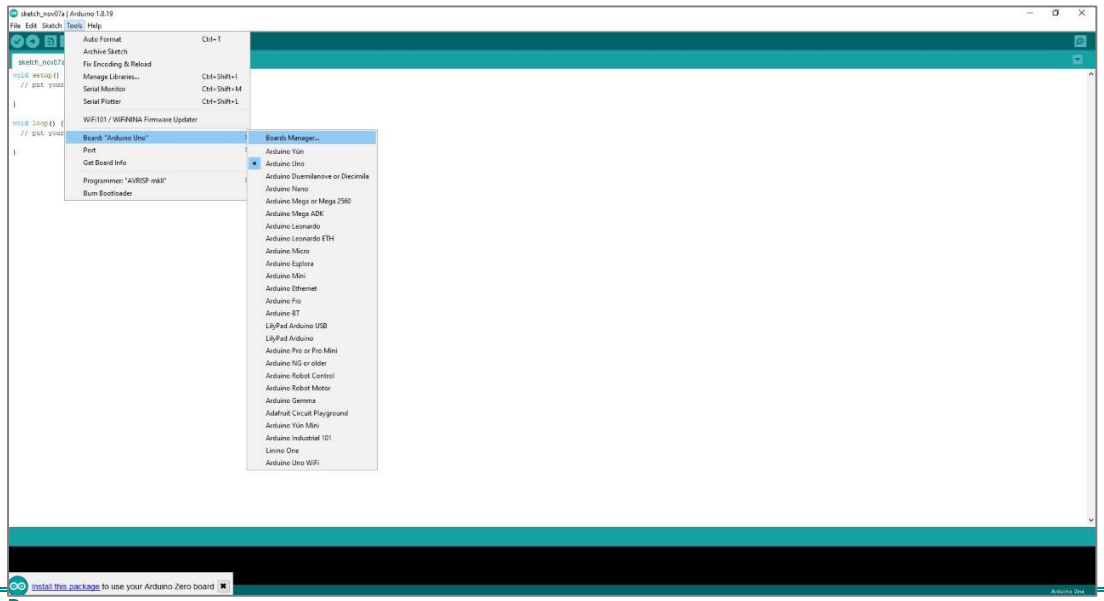
21. Choose installation folder and click on “Next”.



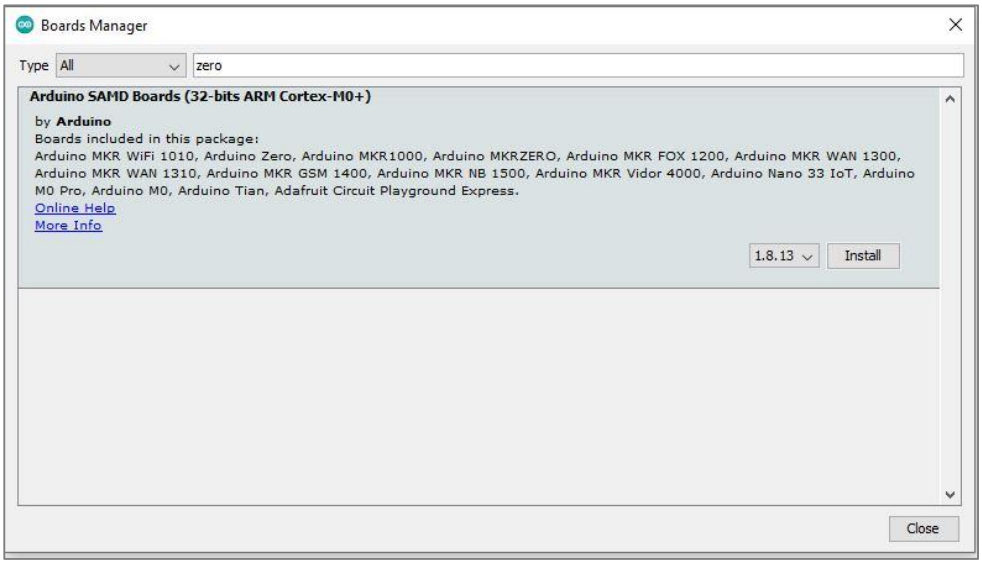
22. Now that the app is installed the following page will open.



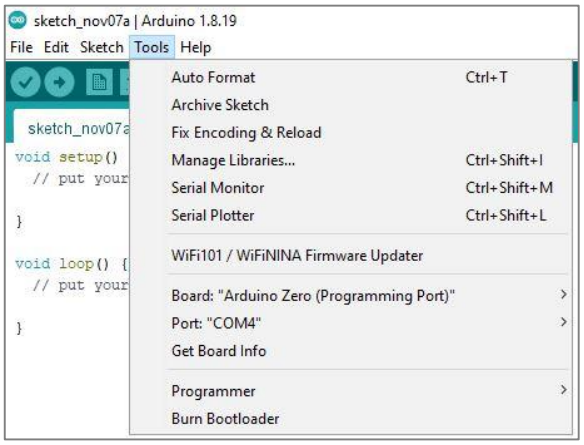
23. To install the boards, go to tools>board> board manager.



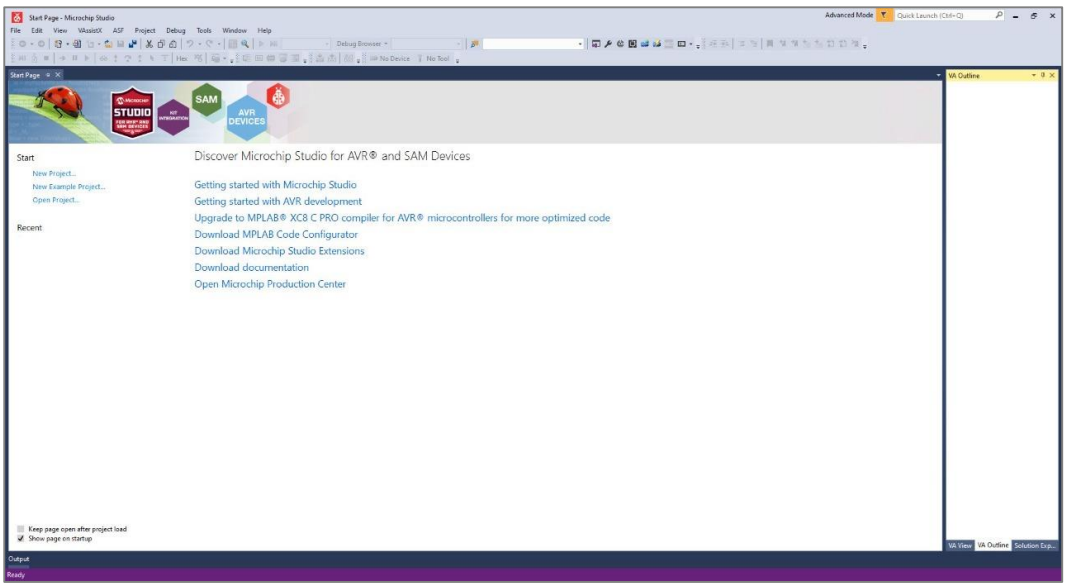
24. The board manager will open, search for the Arduino SAMD boards and install it.



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



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



3. PMM0625 INTEGRATION with MICROCHIP Studio TUTORIAL

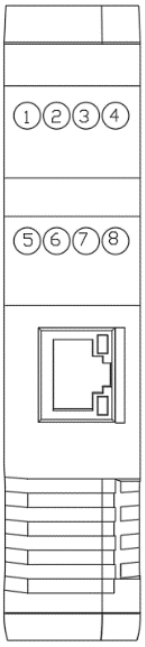
This section is full descriptive of the instructions related to connecting PMM0625 to Visual Studio. PMM0625-T is a reliable digital output module with 8 (80VDC) transistor isolated channels. The module sends digital signals from the CPU to the field actuators controlling their status between on/off. 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.

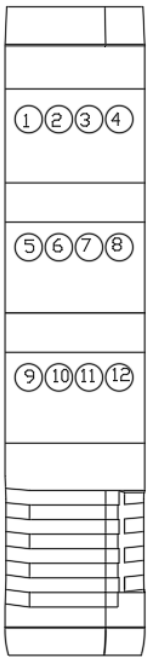
3.1 PIN ASSIGNMENTS

TOP VIEW



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:

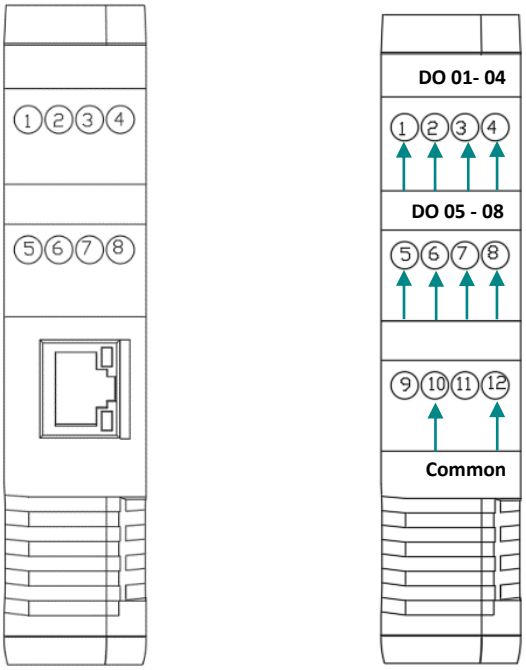
- All devices that are connected to a single serial port must use the same protocol (i.e., either Modbus RTU or Modbus ASCII).
- Connect the D+ with pin no.1 and D- with pin no.2 and Earth with pin no.7 or 8 as illustrated in the pin's assignments to complete the connection successfully.
- Turn on the 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.

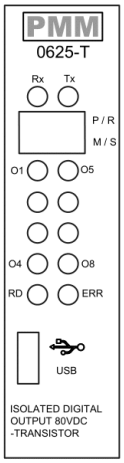
Connecting Digital Output

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.

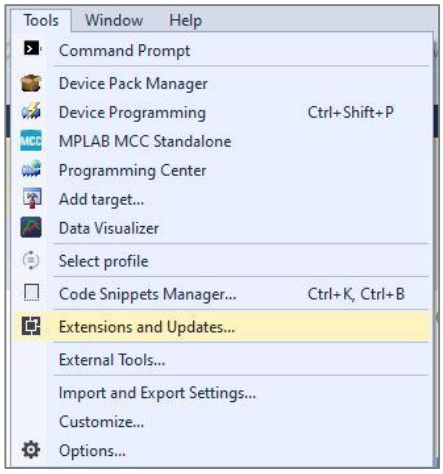
LED No.	Indication
Rx, Tx	Indicating the communication through RS485 port OFF: No Data is being transmitted or received through the port Flickering Green: Data is being transmitted or received through the port
Ox-O8	Indicating the status of Output x OFF: Output x is off Steady-Green: Output x is on



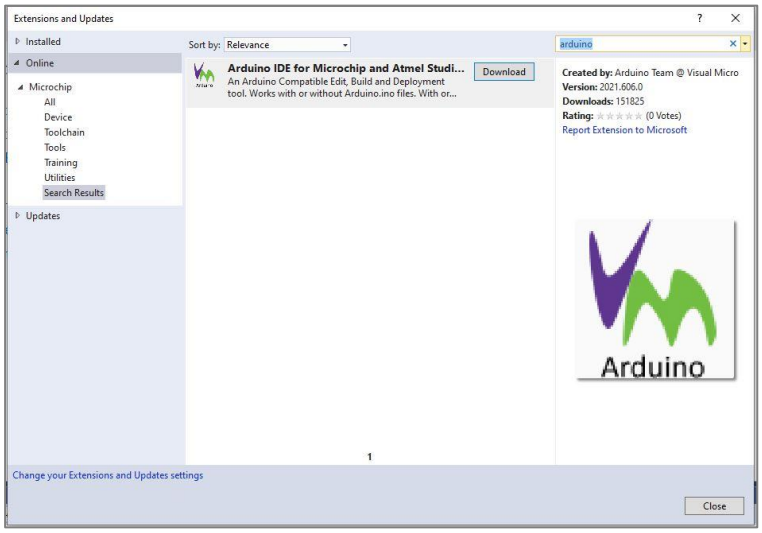
Connecting the USB

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:

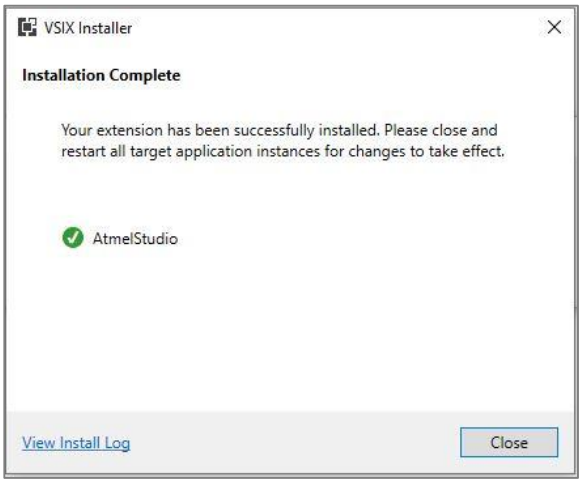
1. First you will have to install the Arduino IDE for Microchip and Atmel Studio from the menu>tools>extensions and updates.



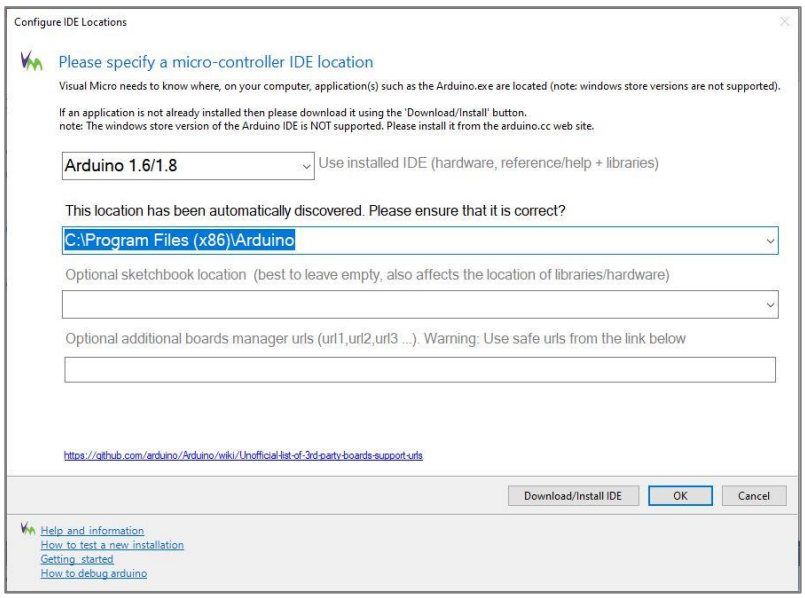
2. Download the Arduino IDE for Microchip and Atmel Studio.



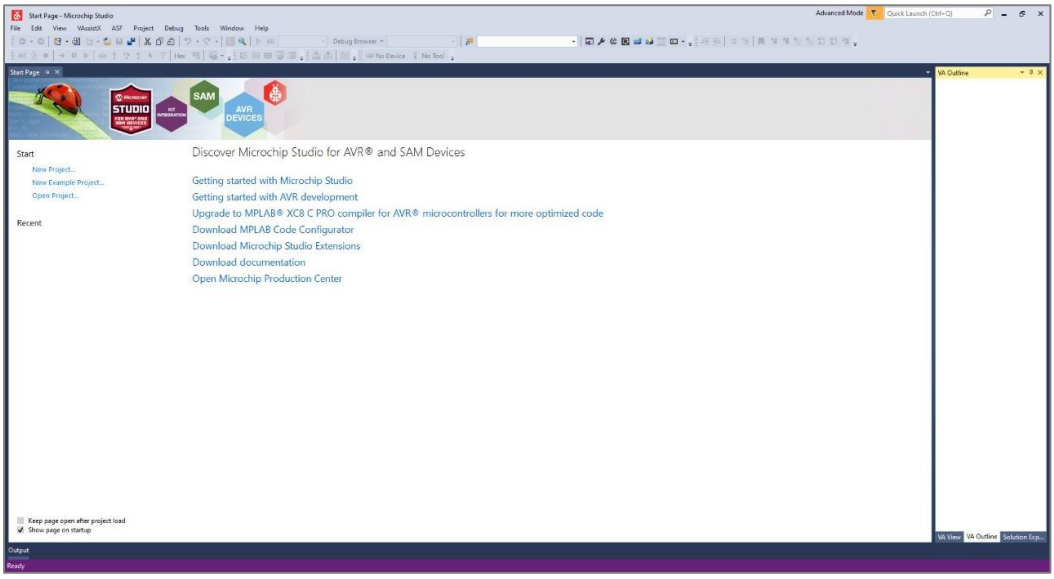
3. Name your project and select desired location.



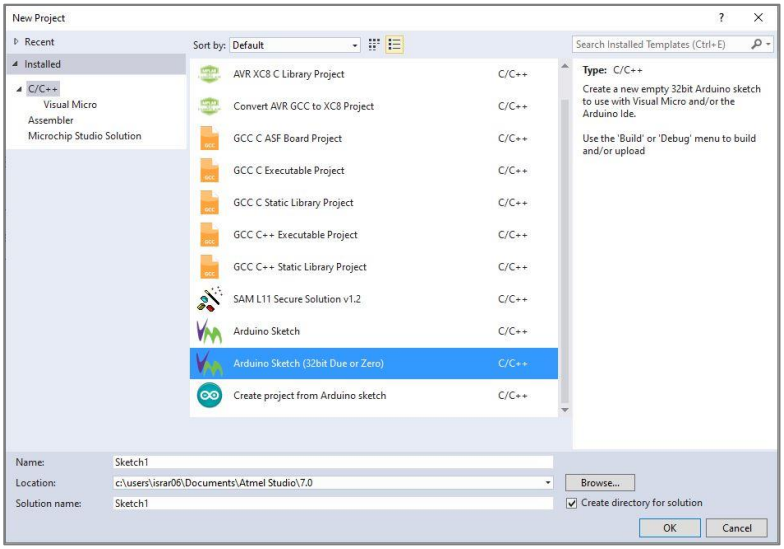
4. Specify a micro controller IDE location.



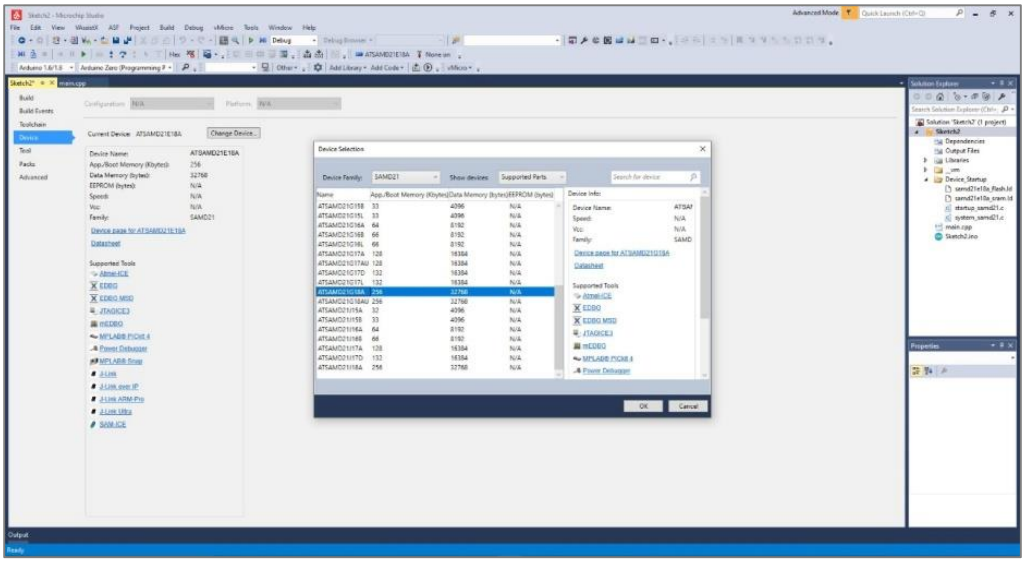
5. To create a new project, start>new project.



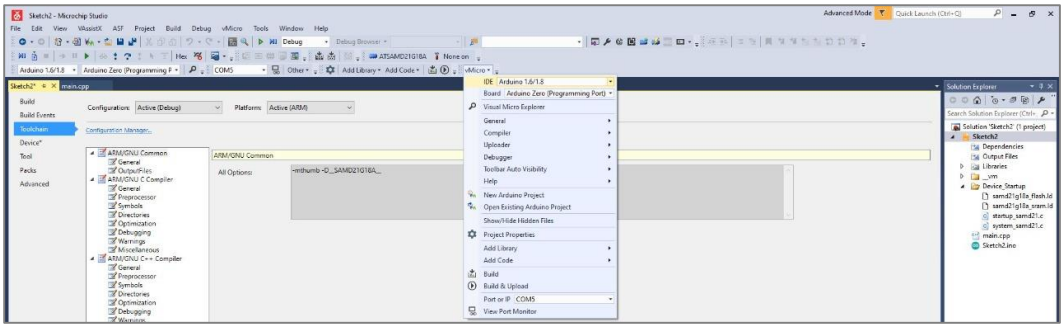
6. Choose the Arduino sketch zero



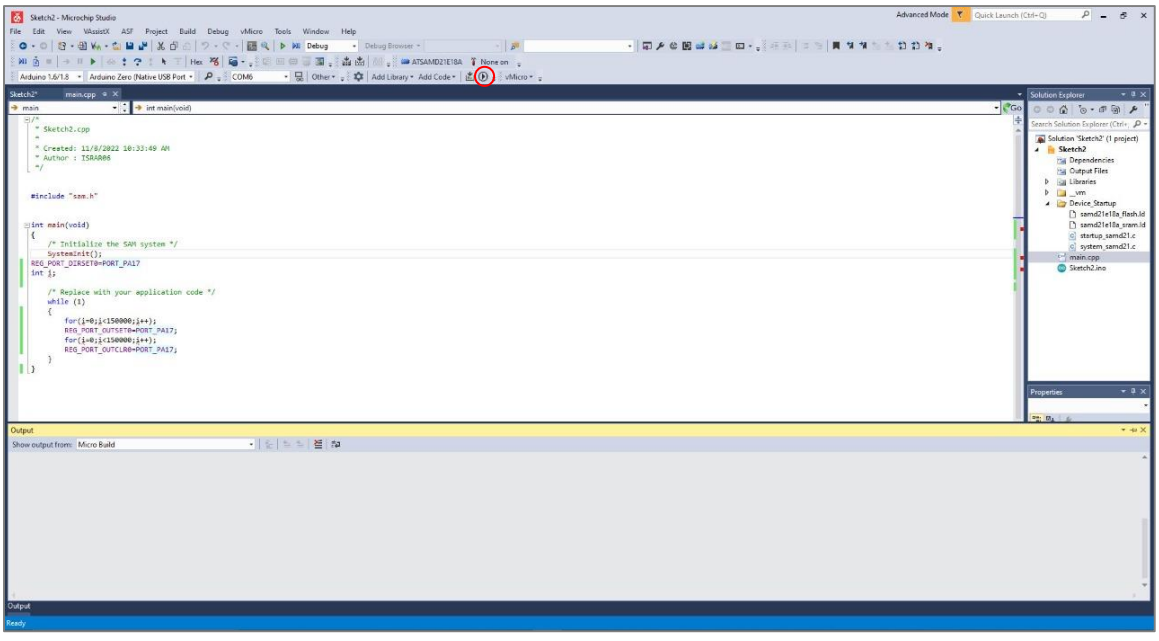
7. Choose the ATSAMD21G18A.



8. Choose the board and port from vmicro



9. Now type your code and build it.



10. Now the program should be running.