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Application Note

AN000568

PCap04

Assembler Programming

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Content Guide

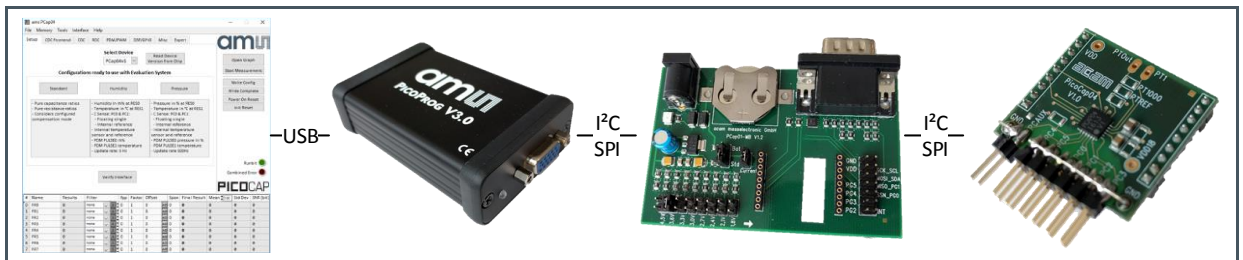
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1 Overview

1.1 Setup

The setup consists of a computer with the PCap04 GUI installed. The computer connects using the PicoProg USB - SPI/I²C interface which is then connected to the PCap motherboard. The PCap motherboard serves as the host for the PCap04 evaluation board. The PCap04 evaluation board can communicate via I²C or SPI. The elements of the set-up are illustrated below.

Figure 1 :
Evaluation Board Setup



The **ams** GUI provides an easy to use interface to exercise the multiple options and features of the PCap04.

1.2 Ordering Information

Ordering Code	Description
PCAP04-BQFN-24	PCap04
PCAP04-EVA-KIT V1.0	PCap04 Eval-Kit

2 Introduction

2.1 Preparation of Software and Hardware

2.1.1 Installing the Software

The software can be downloaded from www.ams.com/PCap04 and is a LabView based GUI that enables full access to the chips register settings.

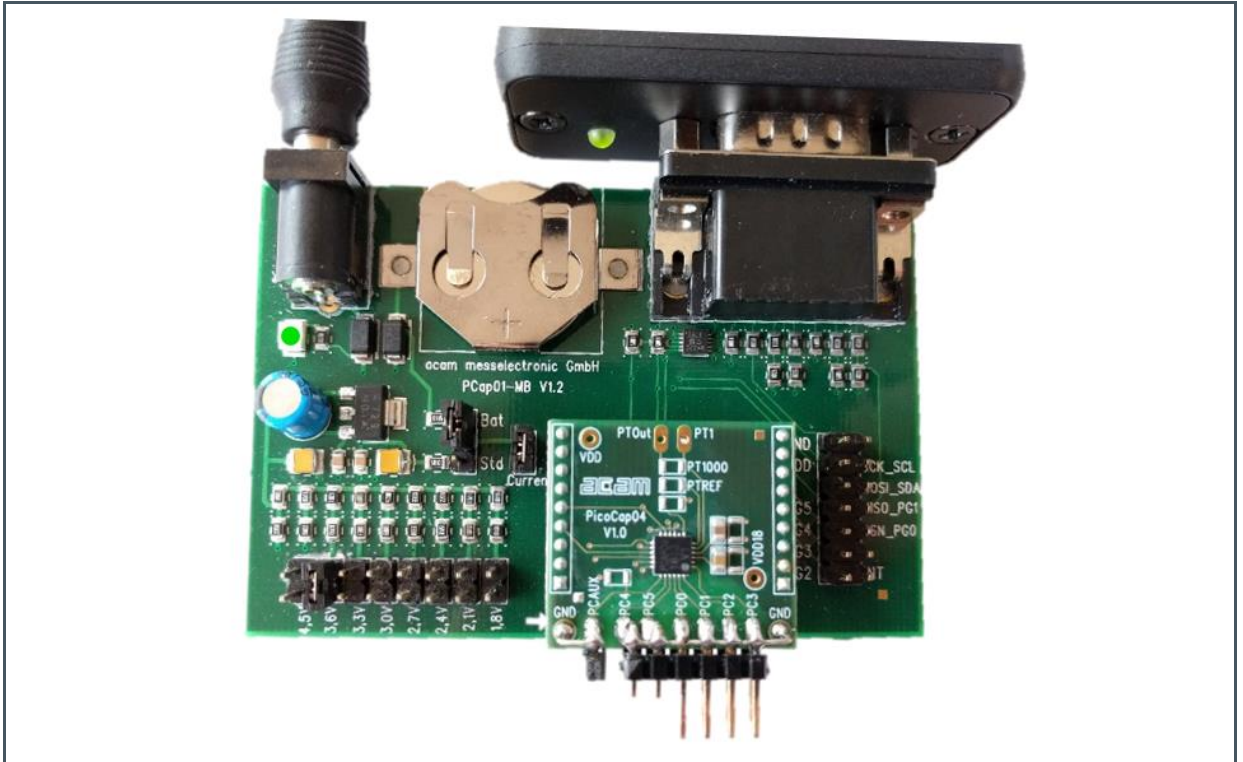
It is crucial to install the software before connecting the evaluation kit to your computer. It is possible that a default driver configuration of your OS will interfere with correct installation.

- Download the latest zipped software installation package to the desired directory.
- Unzip the package to the desired directory.
- Open “setup.exe” from the unzipped directory.
- Follow the instructions on the screen.

2.1.2 Connecting the Hardware

- Connect your computer with the PICOPROG V3.0 using USB cable.
- Connect PICOPROG V3.0 and the evaluation kit motherboard using the DB15 interfaces
- Mount the plug-in board on the corresponding socket on the motherboard.

Figure 2:
Mother Board



- Set the power supply unit to 7.5 V output.
- Connect the motherboard to power via the power supply unit. The green LED on the Eval kit motherboard should be on.

3 Eval Software vs. Assembler

3.1 Files Description



Information

Please do not make any changes in the system folder. Copy the system folder files to your private folder for making changes if desired.

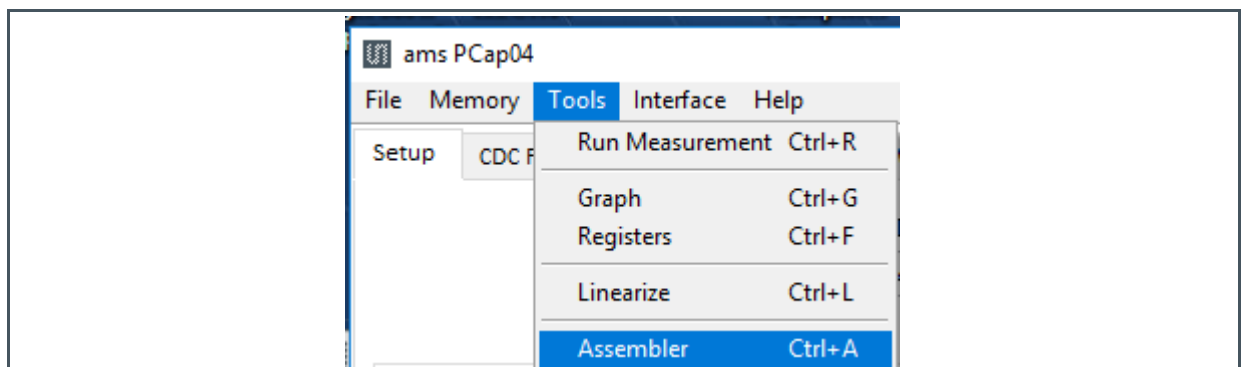
- **.asm** files are assembler files which contains the programming code.
- **.dat** files are the configuration files for Pcap04.
- **.h** files are headers containing the register descriptions of the device.

3.2 How to Handle Assembler Files

3.2.1 Load & Compile Existing Assembler Files

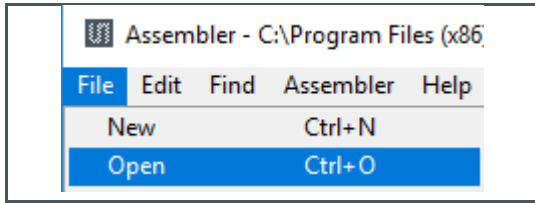
- Launch PCap04 eval software and select Assembler in Tools menu.

Figure 3 :
Tools Menu



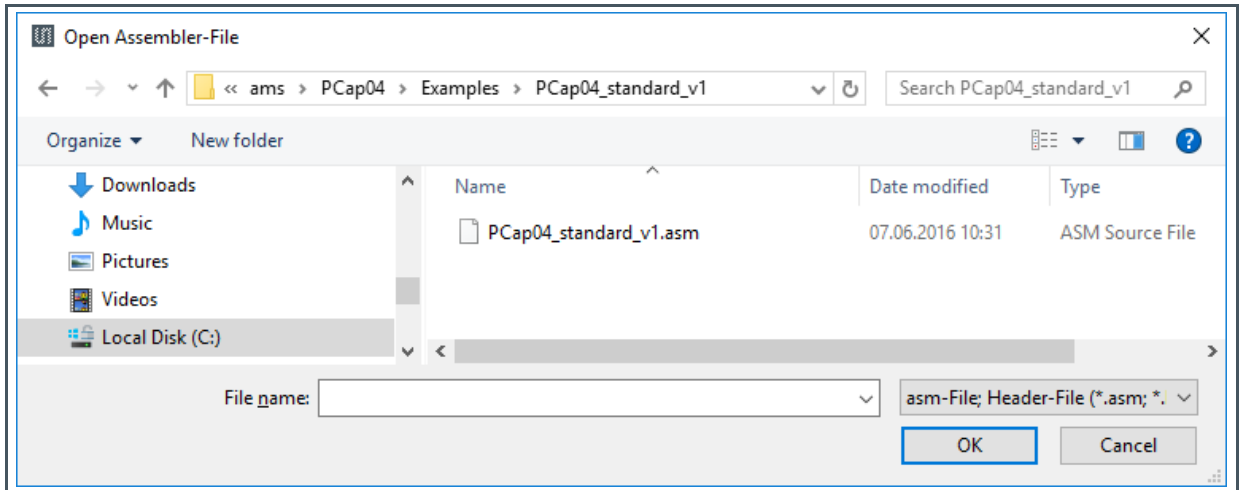
- Next, go to open in File menu

Figure 4:
File Menu



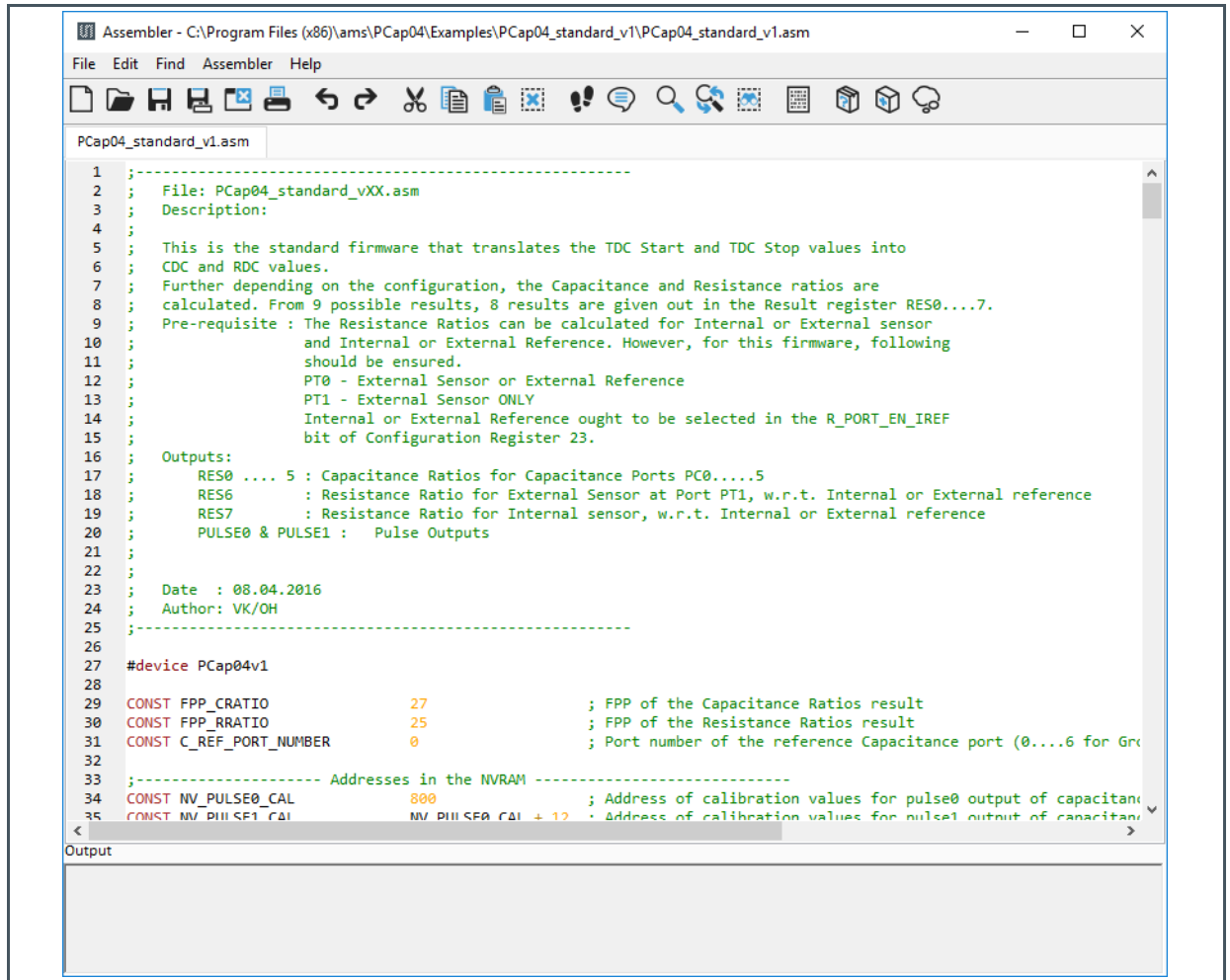
- As an example, select PCap04_standard_v1.1.asm file click OK to load it. For sure, you can choose here another assembler file.

Figure 5 :
Assembler File



After this, you should see the PCap04standard assembler source code.

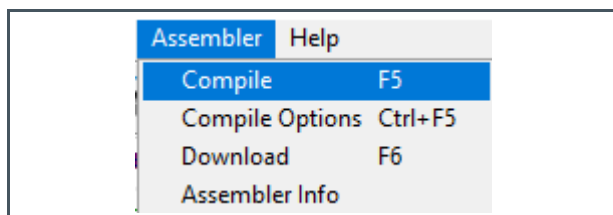
Figure 6 :
Assembler Source Code



Most of the command lines already commented in green for better understanding.

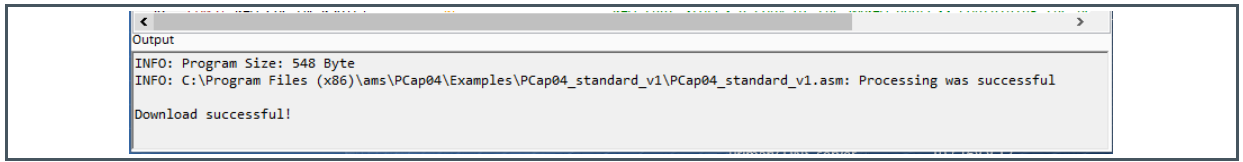
- To Compile and run this code go to Compile in the Assembler.

Figure 7:
Assembler Menu



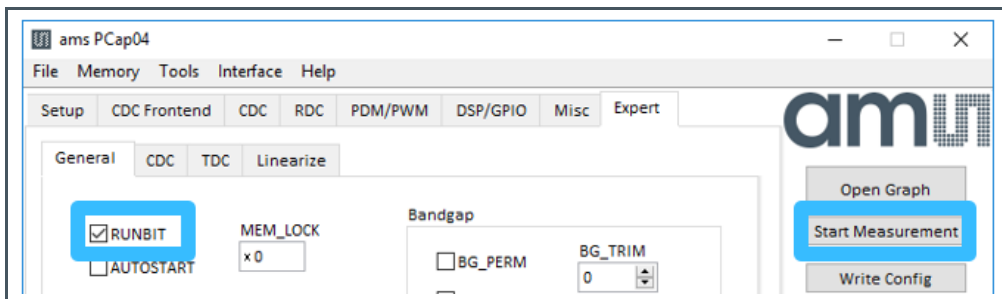
The compiled code will be automatically downloaded to PCap04.

Figure 8 :
Downloaded Output



- RUNBIT needs to be enable before a measurement can be started.

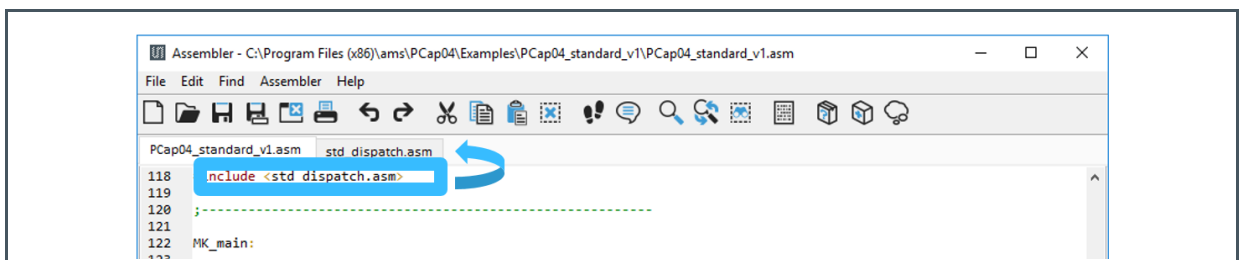
Figure 9:
Enabling RUNBIT



3.2.2 Edit Assembler Files

Double click the #include files to show them on the menu tab.

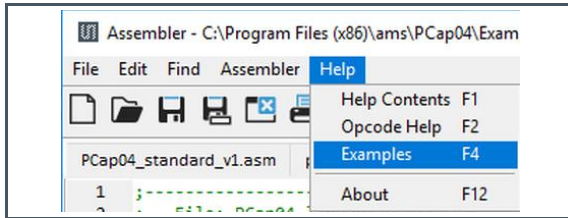
Figure 10 :
Edit Assembler Files



The pcap_standard.h header file contains major address mappings and names for the PCap04. This file should be always included. With the help of the code comments in green, you should be able to edit the code for your own. Alternatively, it is possible to edit existing code samples.

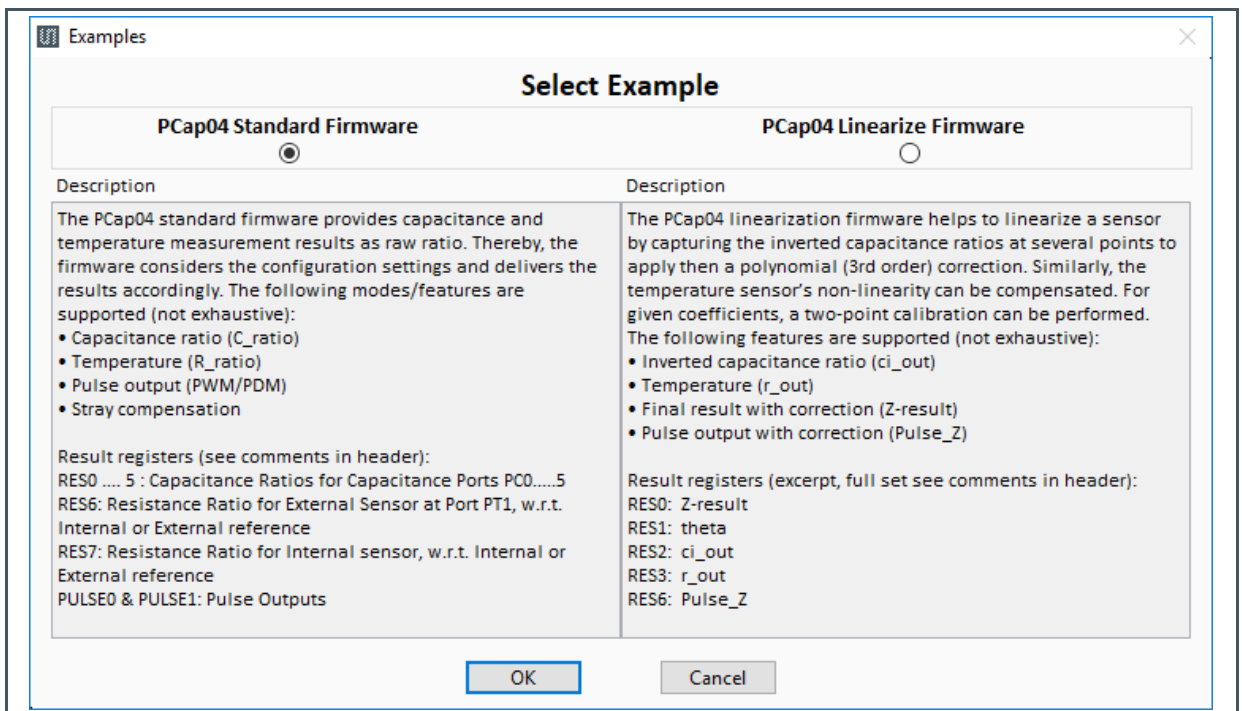
Therefor select Examples in the Help menu.

Figure 11:
Help Menu



Here you can select the linearized example code as well as the standard firmware load.

Figure 12 :
Examples of Linearize and Standard Firmware



We recommend choosing one of these examples for your project. After that, you can easily customize the code to your needs.



Information

You can get an overview of the standard Opcode commands in the help menu.

- This can be found under “Opcode Help” in the “Help” menu

Figure 13:
Opcode Help

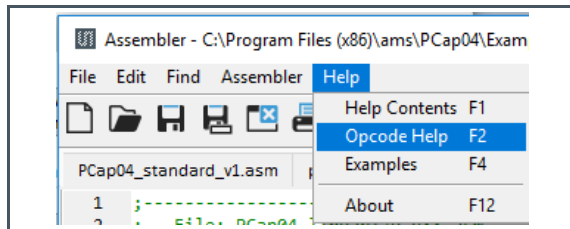
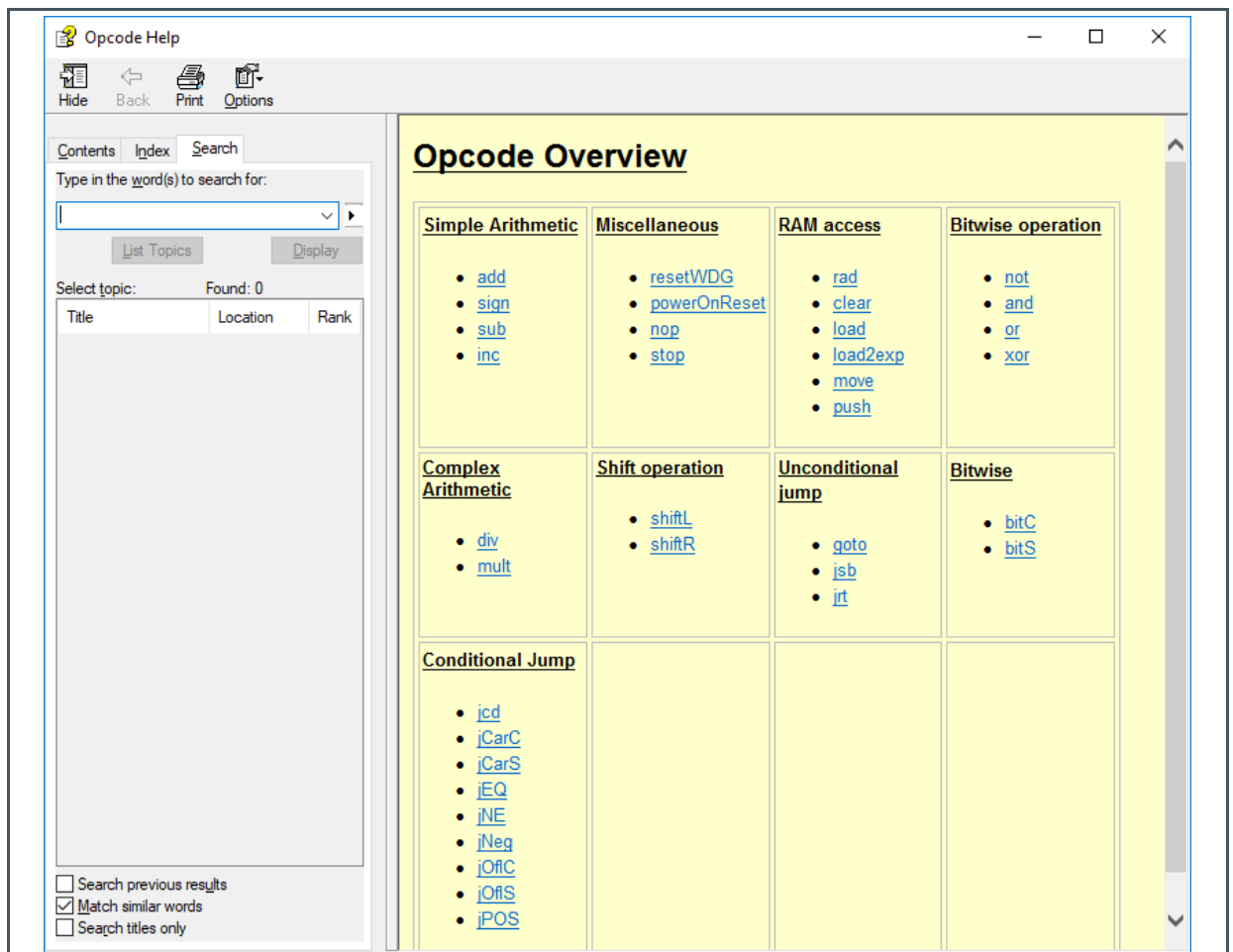


Figure 14 :
Opcode Overview



For further information, please refer to the following documents:

- Device specific Opcodes can be found in the PCap04 datasheet.

4 Store Your Code Permanently

Finally, you can store permanently your firmware in the non-volatile flash memory.



Warning

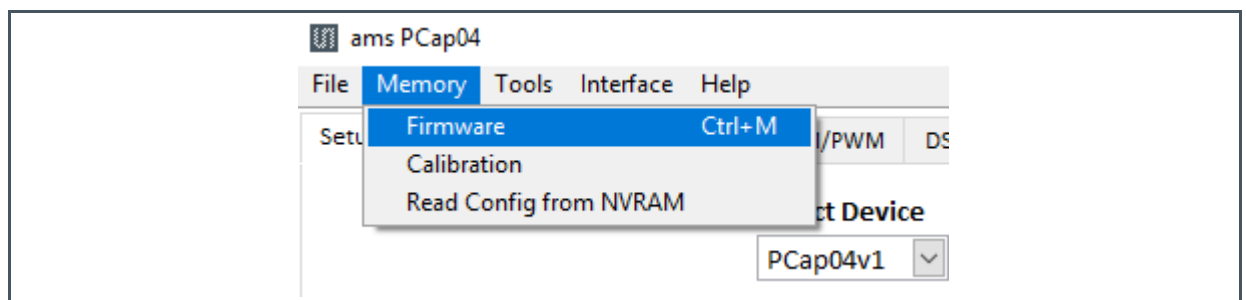
You have to power PCap04 with at least 3.0V for this operation.

Under voltage during flashing the device can permanently damage PCap04 !

Follow these steps to accomplish this:

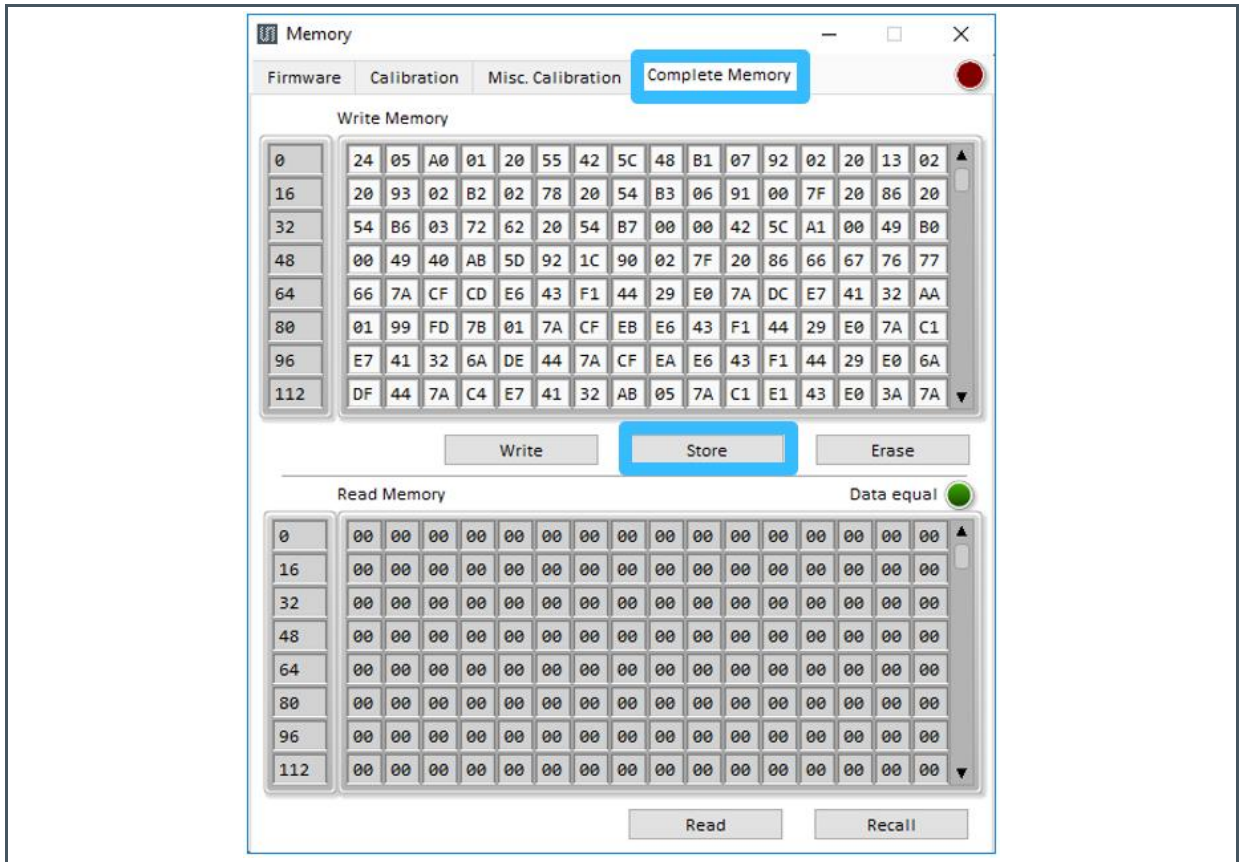
- Compile and download your code
- Switch to main window and go to Firmware in Memory menu.

Figure 15 :
Memory Menu



- Then push “Store” button in the “Complete Memory” tab

Figure 16 :
Complete Memory Tab

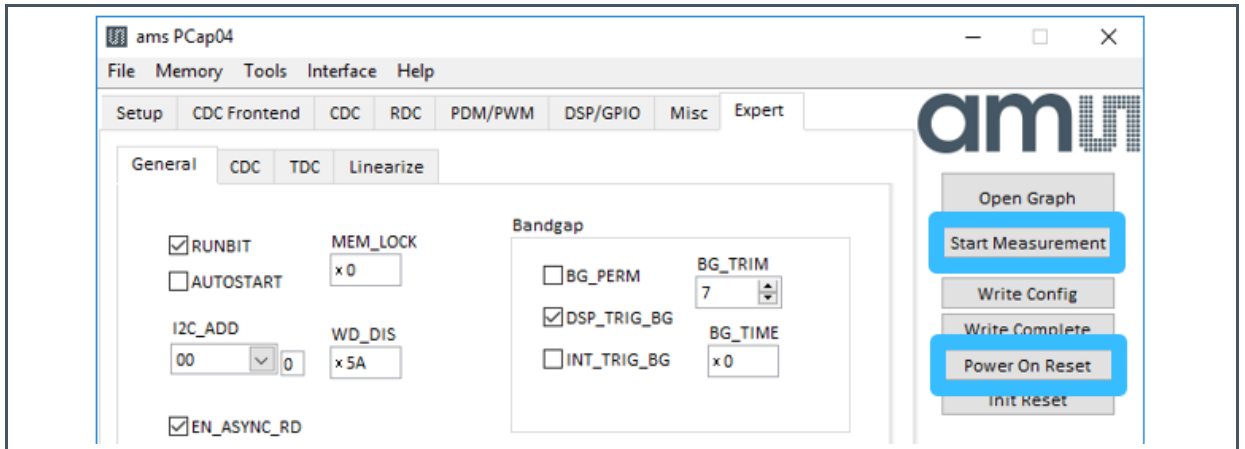


Now your new compiled firmware is permanently stored in the NVRAM.

Test your operation by power cycling the device

- Click the "Power On Reset" Button in the main screen to enable power cycling.

Figure 17 :
Expert Menu



- Now your measurements can be started without compiling and downloading.

5 Revision Information

Changes from previous version to current revision v1-00	Page
Initial version	

- Page and figure numbers for the previous version may differ from page and figure numbers in the current revision.
- Correction of typographical errors is not explicitly mentioned.

6 Legal Information

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