

## Demo – Read me

The software is divided in two parts:

- 1) An MPLAB application to be loaded on the FLEX micro-controller (dsPIC33FJ256MC710); and
- 2) A Win32 application for serial data acquisition and image visualization.

### 1 - PC Side Application

#### Requirements

The program uses cygwin1.dll (included in the distribution), that can either be shared through the windows PATH environment variable or be placed in the executable directory.

#### Usage

The program must be executed in a command prompt window (Microsoft/Cygwin). The program execution details are explained in file 'PC-Side Readme.pdf'. For further information, please refer to the document section under the 'PC\_side' directory.

### 2 - Flex Side Application

#### Requirements

The following is a list of hardware components required to reproduce the demo:

- FLEX Base Board (Light or Full)
- Home made PCB for serial RS232 voltage conversion
- Few capacitors and connectors
- A CAMVGA100 module

#### Usage

Using the Project Wizard, create a new MPLAB project in the Flex -side directory and build the executable file. Or alternatively, using the *\$makefile* to create the project.

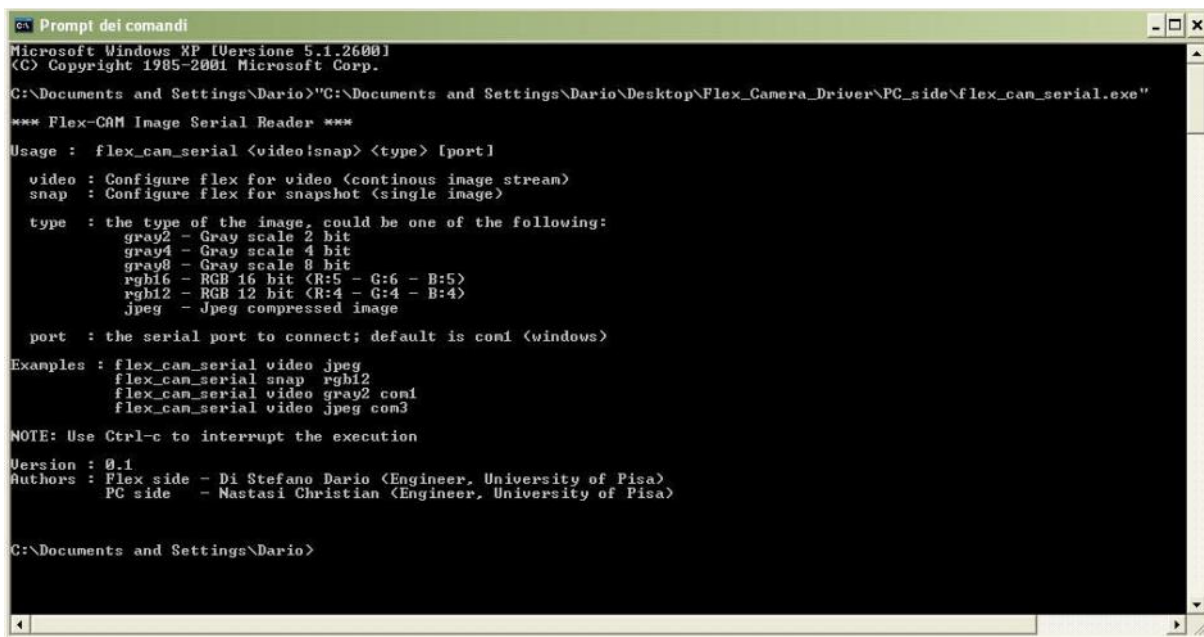
Then program the microchip device by means of an ICD2 programmer.

Check all wiring and connections, and also verify that the serial transmitter and receiver, both are set at the same baudrate.

This demo application permits to verify proper functioning of most of the dsPIC33F microcontroller peripherals.

### 3 - Example:

- Download and save the zipped folder and unzip it to a local directory (the directory name should not contain any blank spaces).
- In Cygwin environment use GNU Make utility for both the applications to compile and link all the files, to create the executable file (under the 'PC\_side' directory) 'flex\_cam\_serial.exe' and the Microchip debug file (under the 'Flex\_side' directory) 'Demo.cof'.
- Open a commands prompt window (Windows/Cygwin) and using the mouse control, drag drop in the executable file 'flex\_cam\_serial.exe'. Press the return key (refer Figure 1 below).



```
Prompt dei comandi
Microsoft Windows XP [Versione 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\Dario>"C:\Documents and Settings\Dario\Desktop\Flex_Camera_Driver\PC_side\flex_cam_serial.exe"

*** Flex-CAM Image Serial Reader ***

Usage : flex_cam_serial <video|snap> <type> [port]

video : Configure flex for video <continous image stream>
snap  : Configure flex for snapshot <single image>

type  : the type of the image, could be one of the following:
        gray2 - Gray scale 2 bit
        gray4 - Gray scale 4 bit
        gray8 - Gray scale 8 bit
        rgb16 - RGB 16 bit <R:5 - G:6 - B:5>
        rgb12 - RGB 12 bit <R:4 - G:4 - B:4>
        jpeg  - Jpeg compressed image

port  : the serial port to connect; default is com1 <windows>

Examples : flex_cam_serial video jpeg
           flex_cam_serial snap rgb12
           flex_cam_serial video gray2 com1
           flex_cam_serial video jpeg com3

NOTE: Use Ctrl-c to interrupt the execution

Version : 0.1
Authors : Flex side - Di Stefano Dario <Engineer, University of Pisa>
          PC side   - Nastasi Christian <Engineer, University of Pisa>

C:\Documents and Settings\Dario>
```

Figure 1 – PC side help

- Use Microchip MPLAB IDE environment to work on the FLEX side firmware and import the file 'Demo.cof'. Open 'Disassembly Listing' and 'Program Memory' windows to view the code and the debug symbols (refer Figures 2 and 3 below).

Refer Microchip's documentation for more information on MPLAB IDE environment.

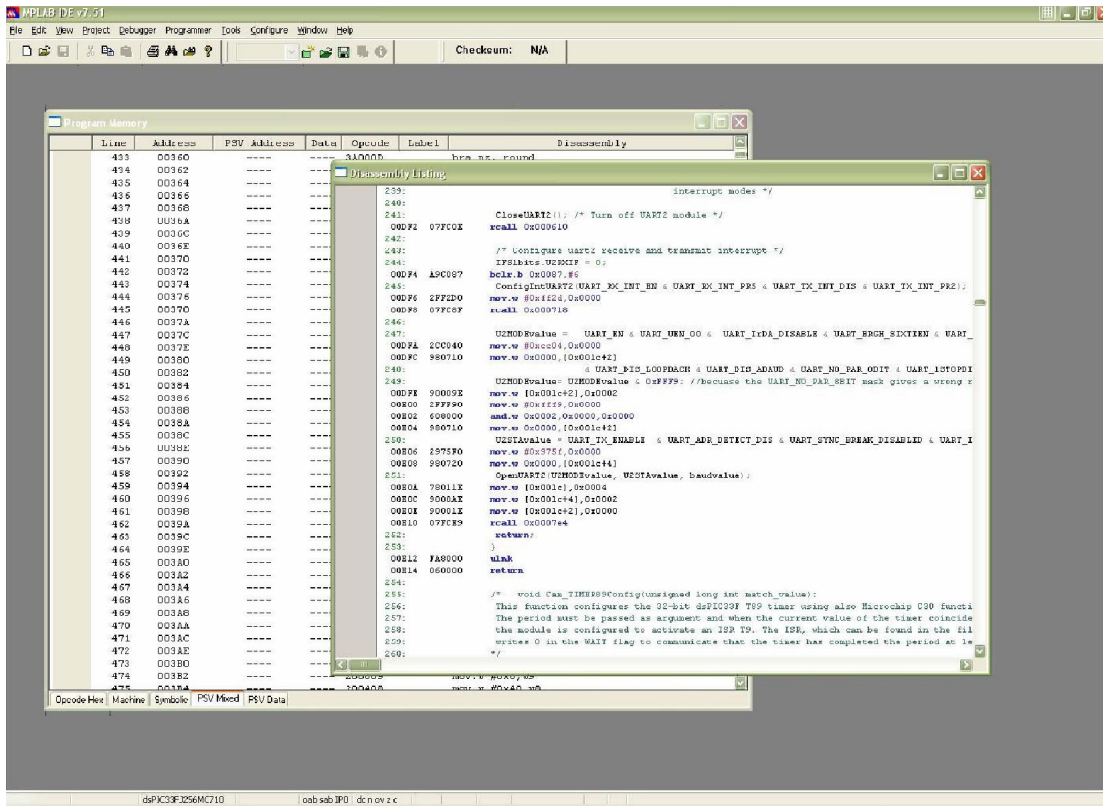


Figure 2 – MPLAB IDE after importing Demo.cof

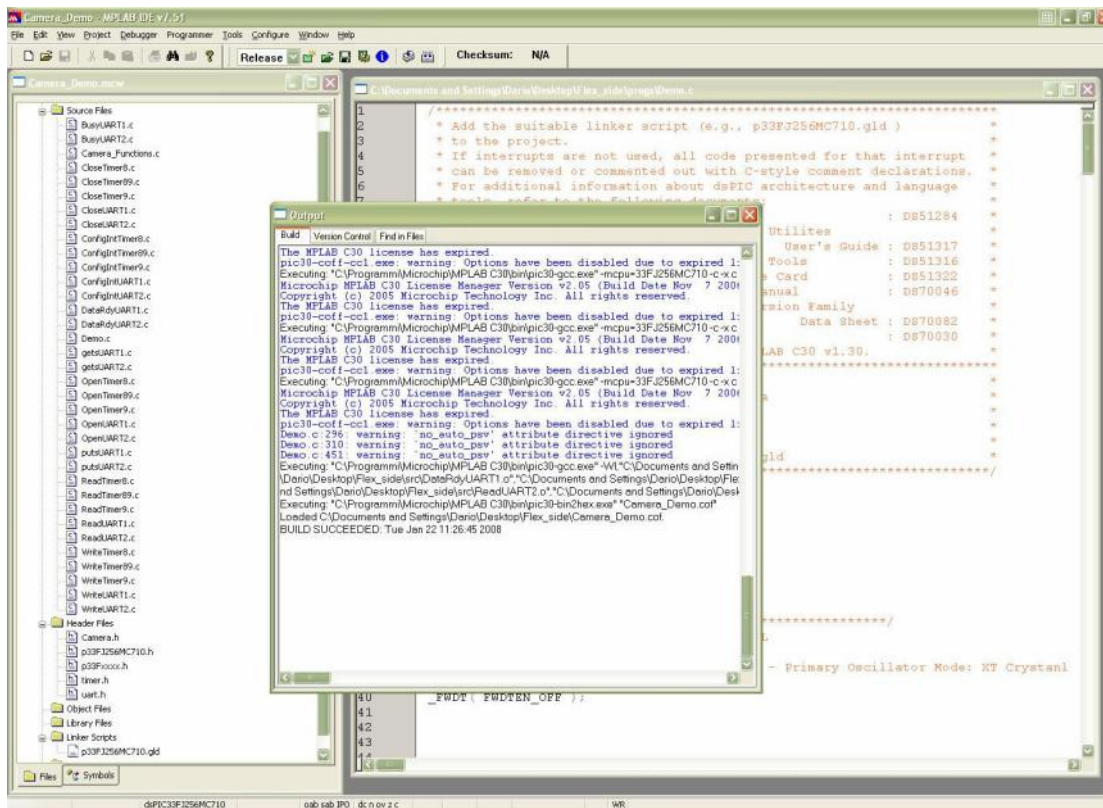


Figure 3 – MPLAB IDE project window and building

- 
- The screenshot displays the MPLAB IDE v8.00 environment. The main window shows the 'Program Memory' disassembly view with the following content:
- | Line | Address | Opcode | Disassembly     |
|------|---------|--------|-----------------|
| 1    | 000000  | 042310 | goto 0x002310   |
| 2    | 000002  | 000000 | nop             |
| 3    | 000004  | 002310 | DefaultInter... |
- The 'Output' window is open, showing the following log messages:
- ```

Build Version Control Find in Files MPLAB ICD 2
Auto-connect not enabled - Not connecting (Try enabling auto-connect on the CD2 settings pages.)
Connecting to MPLAB ICD 2
...Connected
Setting Vdd source to target
Target Device dsPIC33FJ256MC710 found, revision = Rev 0x3002
Reading ICD Product ID
Running ICD Self Test
...Passed
MPLAB ICD 2 Ready
Programming Target...
...Validating configuration fields
...Creating Port
...Programming Programming Executive
...Verifying Programming Executive
...Programming Program Memory (0x0 - 0x3FFF)
Verifying...
...Program Memory
...Verify Succeeded
...Programming Configuration Bits
...Config Memory
Verifying configuration memory...
...Programming succeeded
22-Jan-2008, 12:07:53

MPLAB ICD 2 Ready
  
```
- The status bar at the bottom indicates the active project is 'dsPIC33FJ256MC710' and the target is 'dsPIC33FJ256MC710'.

- Re-execute the executable file with the desired attribute (for example: video jpeg) to start the demo (refer Figure 5 below)

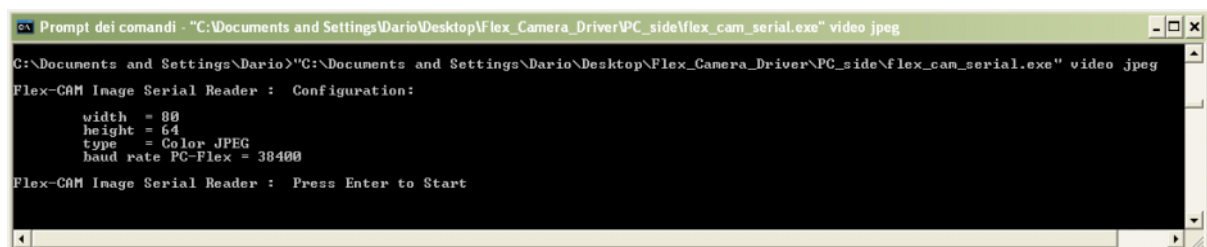


Figure 5 – PC side Demo start

- If the images are not visible, select and move the little window (refer Figure 6 below)

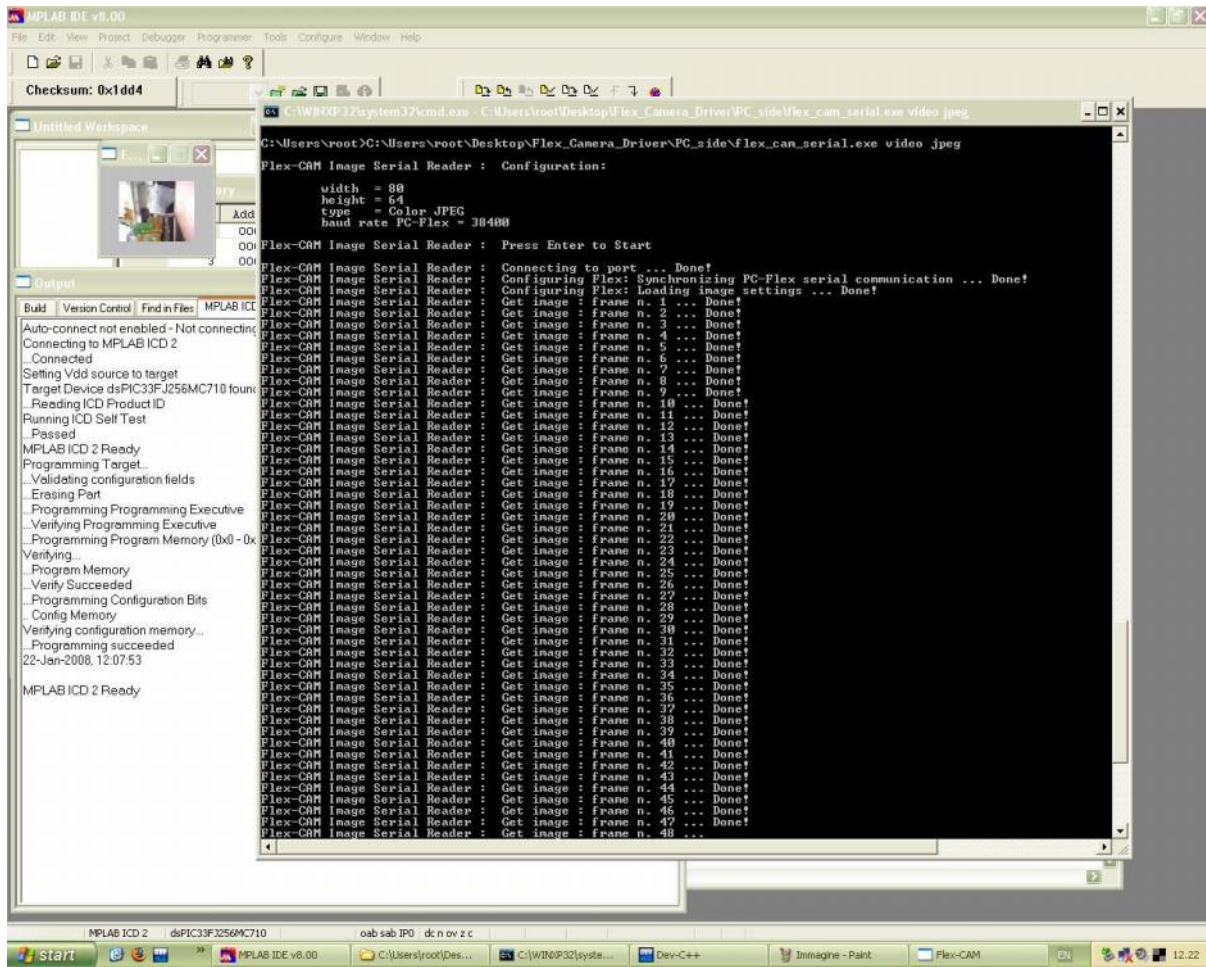


Figure 6 – Demo in progress



- Use Ctrl-C to quit the demo (refer Figure 7 below)

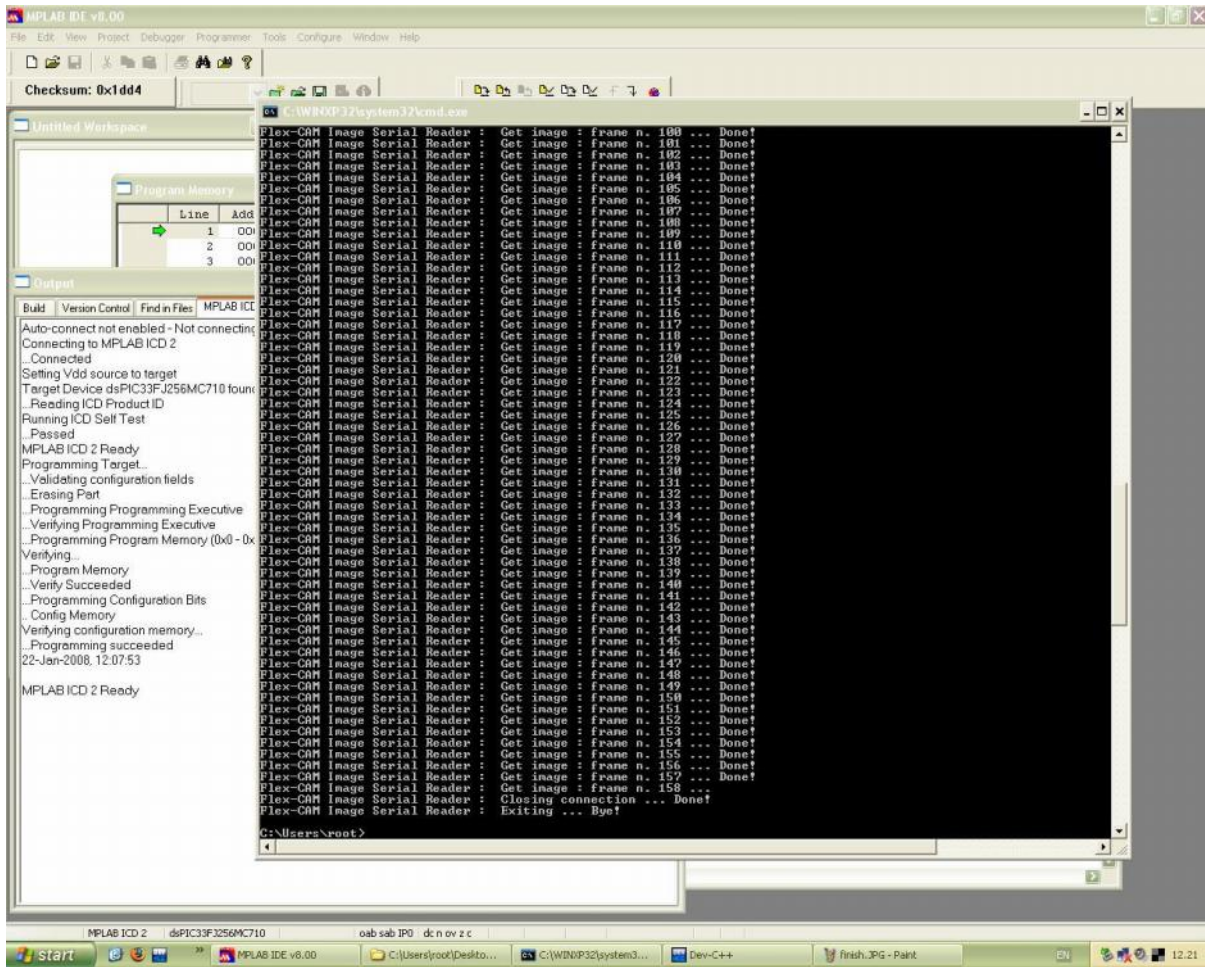


Figure 7 – Demo finish