



Stage 2 Mechatronics - Lab Notes



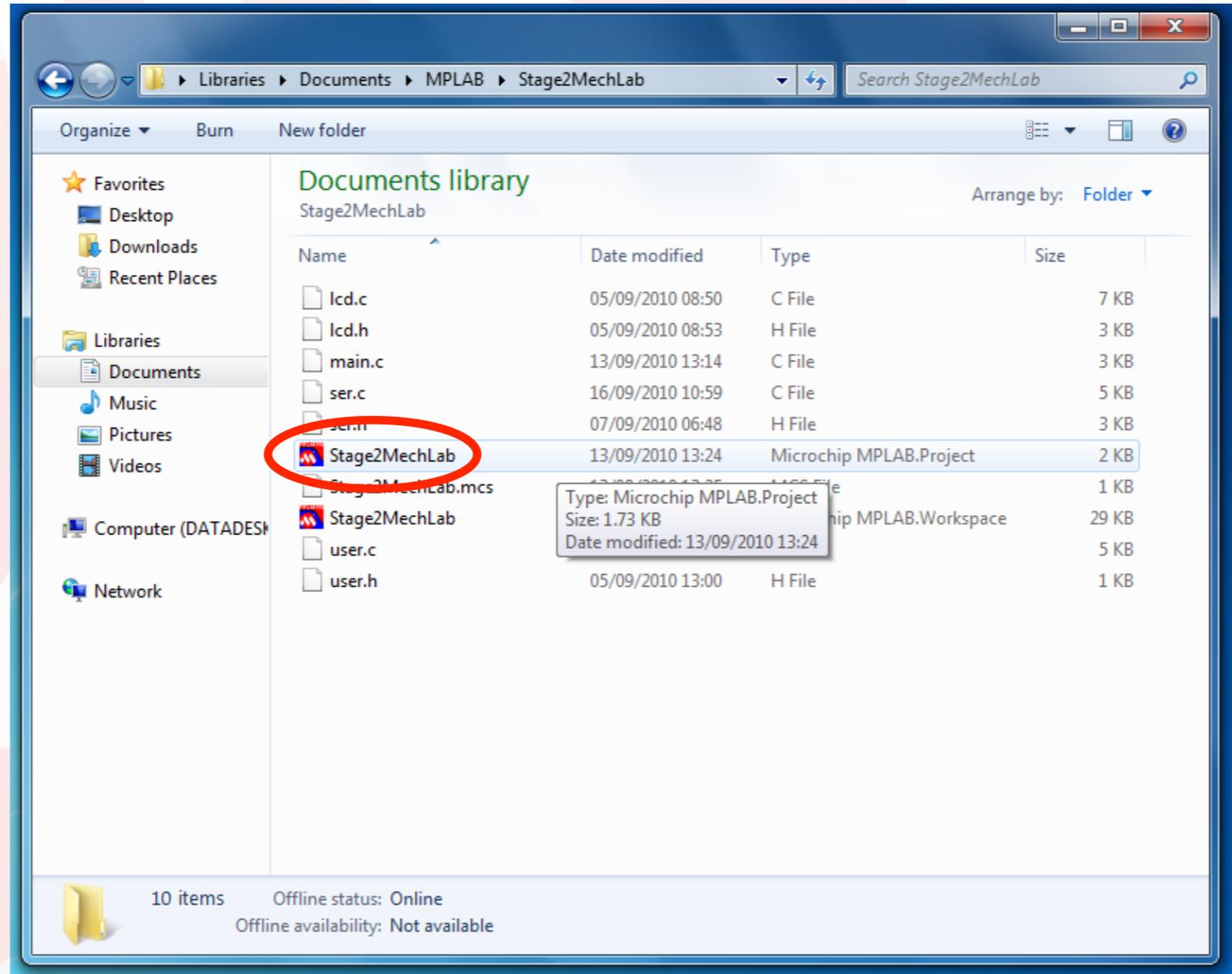
MPLAB IDE - Stage2MechLab

Starting with an existing project

Open the *Stage2MechLab* project file (on the D: or E: drive).

If MPLAB complains about write permission at this point, just click cancel.

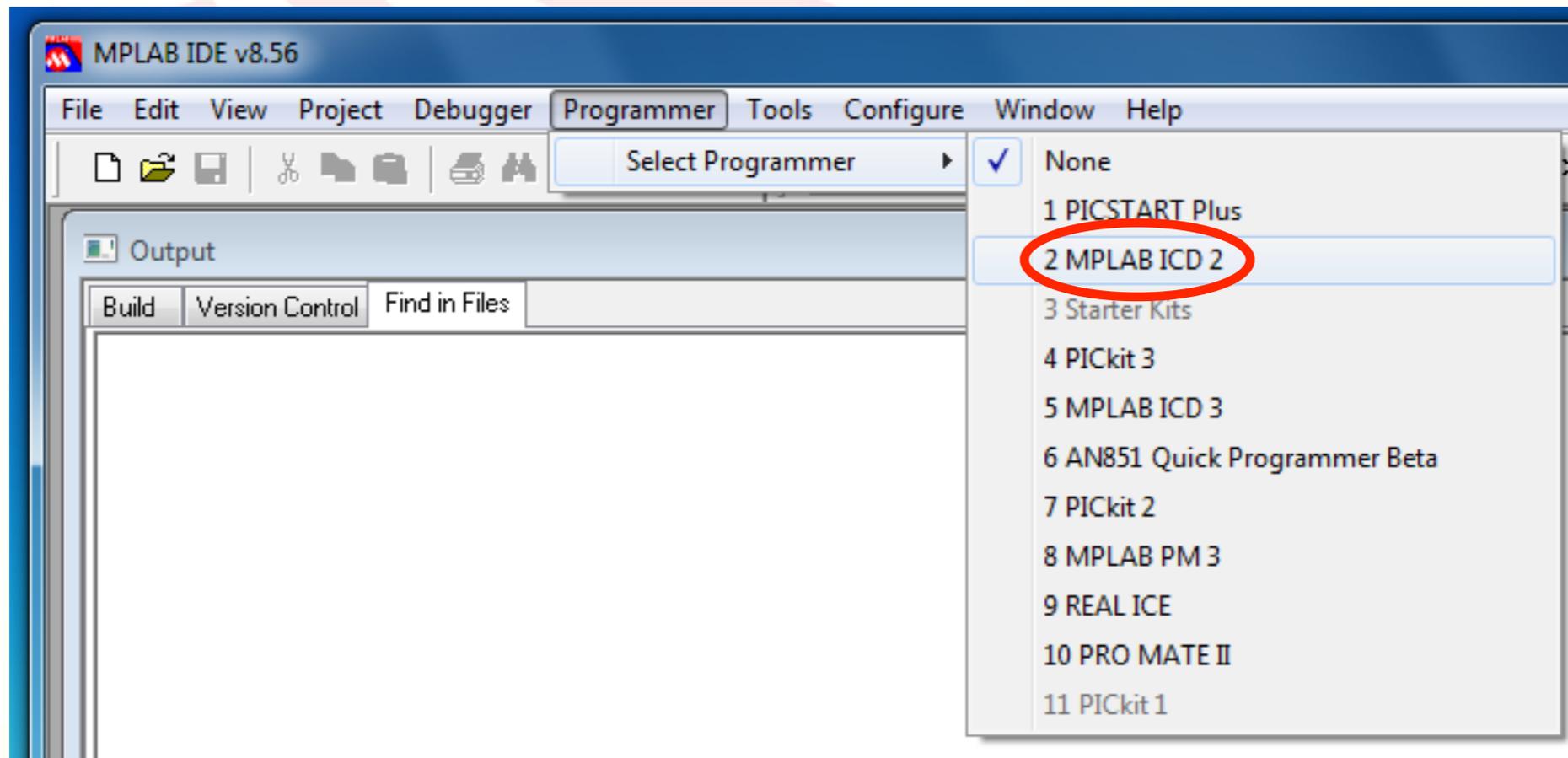
Use 'Save Project As...' to save the project to a folder on your H: drive.





MPLAB IDE - Choosing the Programmer

Once the compiler has created the binary program, this needs to be transferred to the PIC. One tool for doing this is the MPLAB ICD 2 which can connect to the computer via USB.





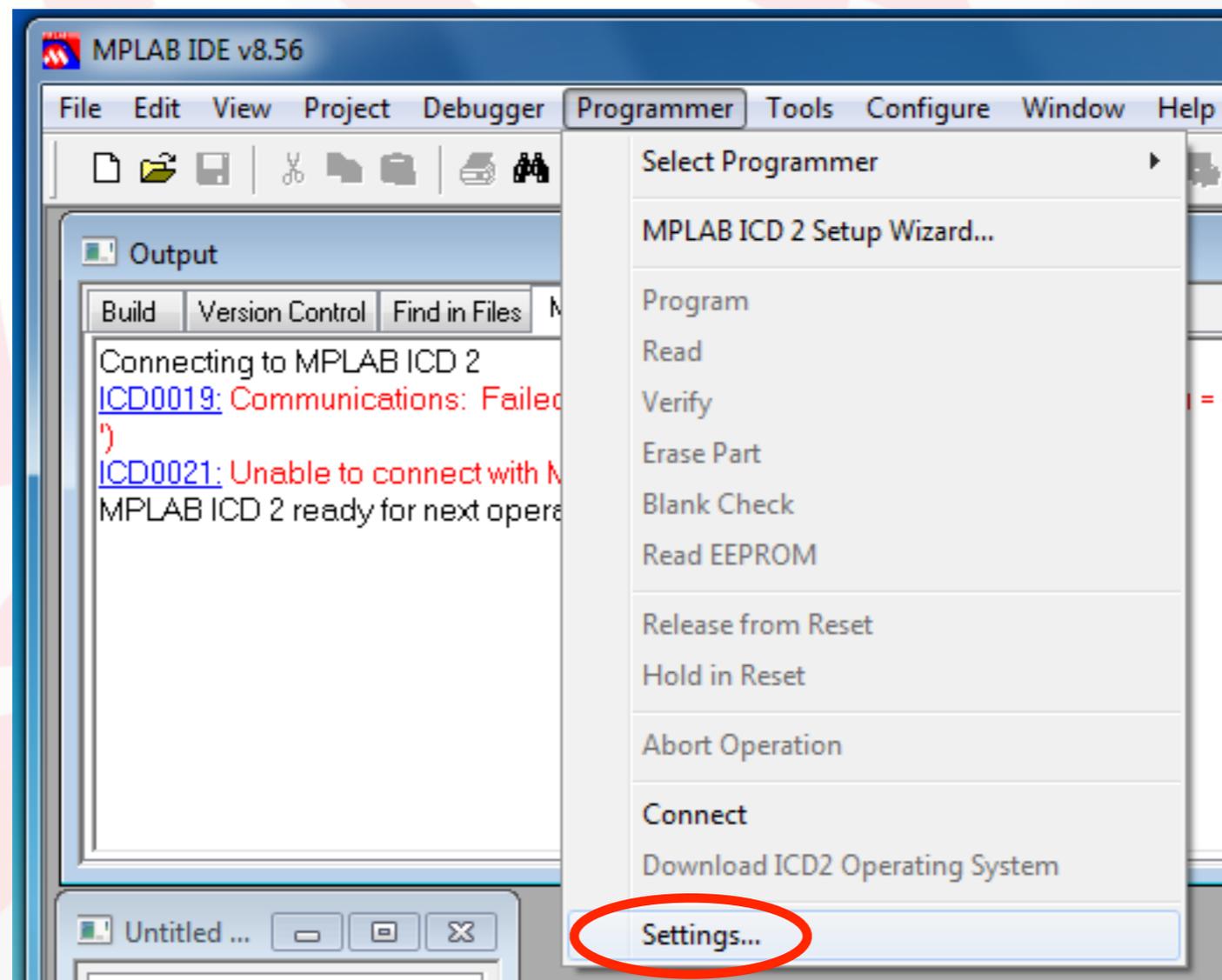
MPLAB IDE - Configuring the ICD2

Before continuing, check the settings.

MPLAB may start the Wizard automatically. If so:

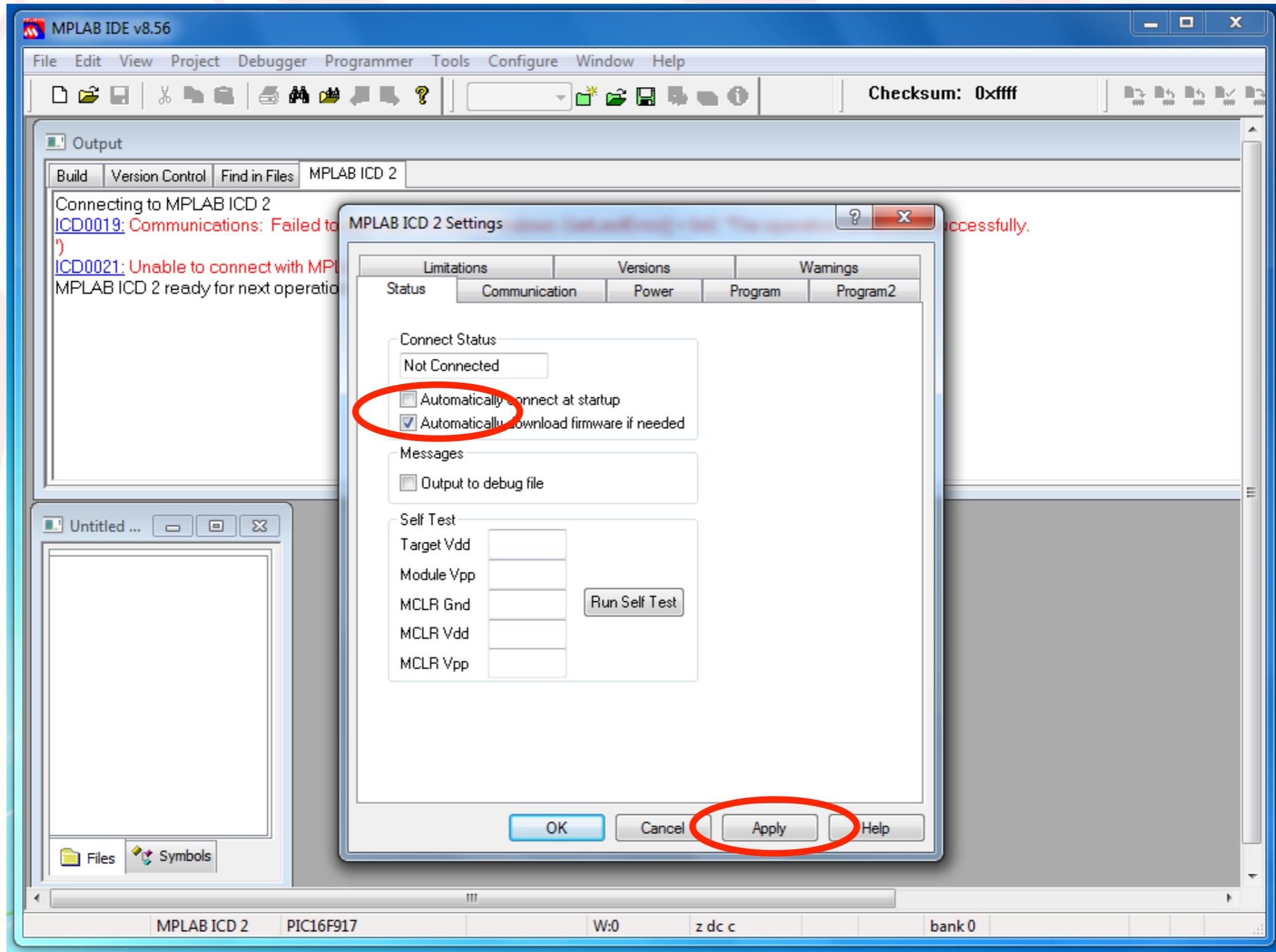
- choose **USB** as the connection method
- **power is supplied to the device, not the ICD2, and**
- **leave everything else as the default.**

It is best if MPLAB *does not* connect automatically to the ICD 2 programmer.





MPLAB IDE - Configuring the ICD2

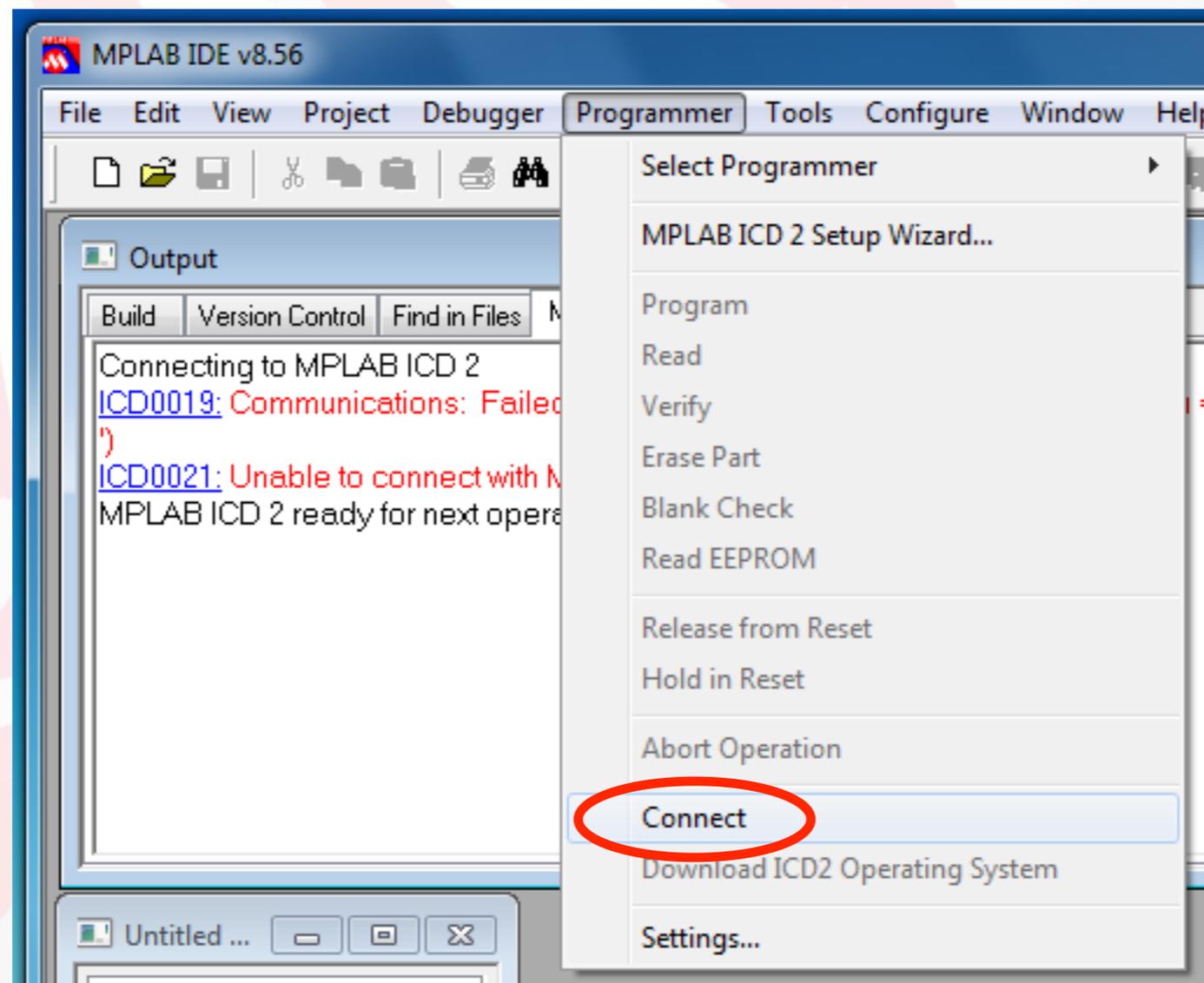




MPLAB IDE - Connecting to the ICD2

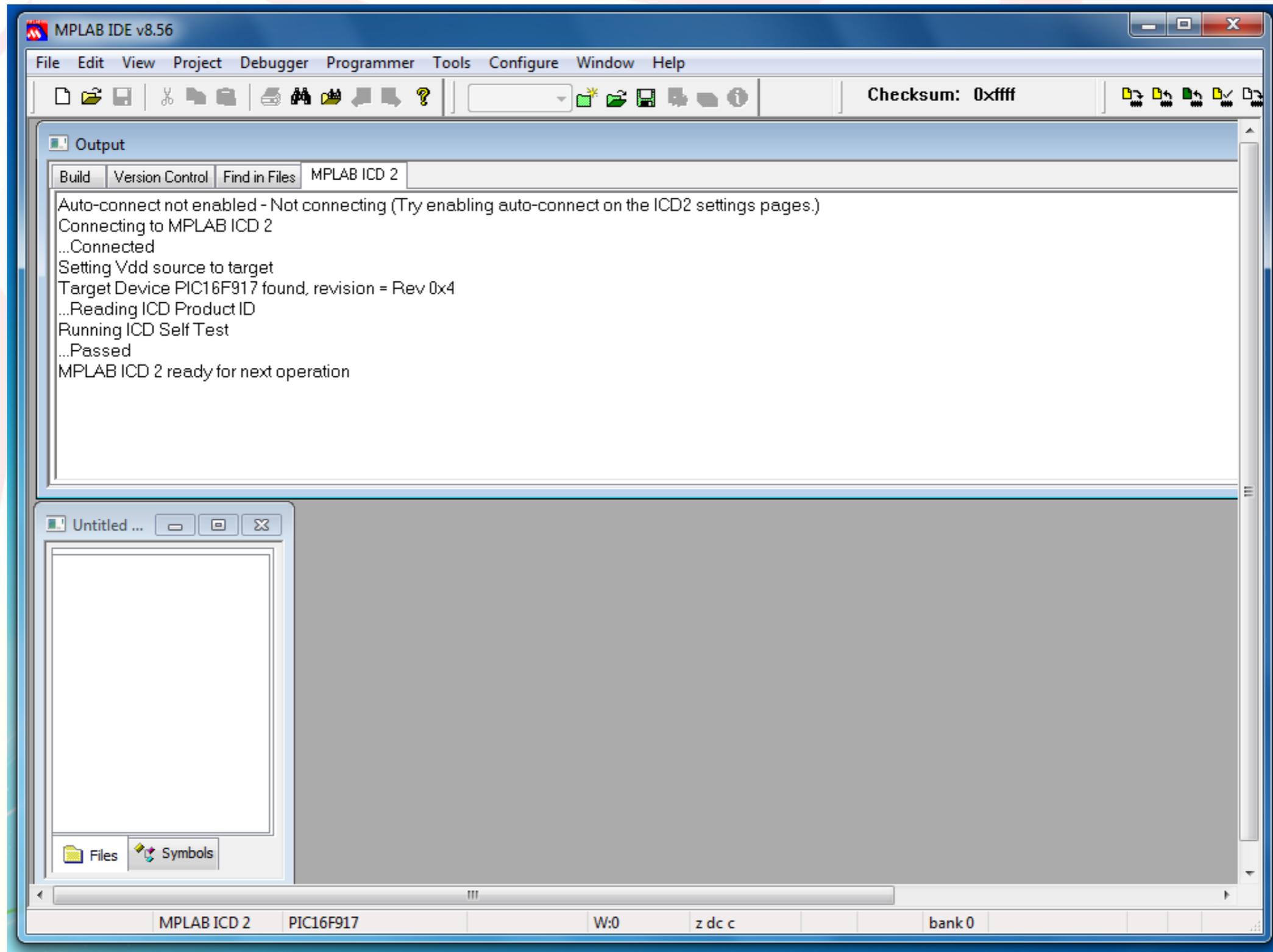
Since the MPLAB does not connect automatically to the ICD 2 programmer, we need to connect via the menu. Do this *before* programming the PIC, but only *after* connecting the ICD2 to the mechatronics board.

If MPLAB starts to download an operating system, that's okay. (Check that 'PIC16F917' is shown at the bottom of the MPLAB window; if not, follow the instructions at the end of this document.)



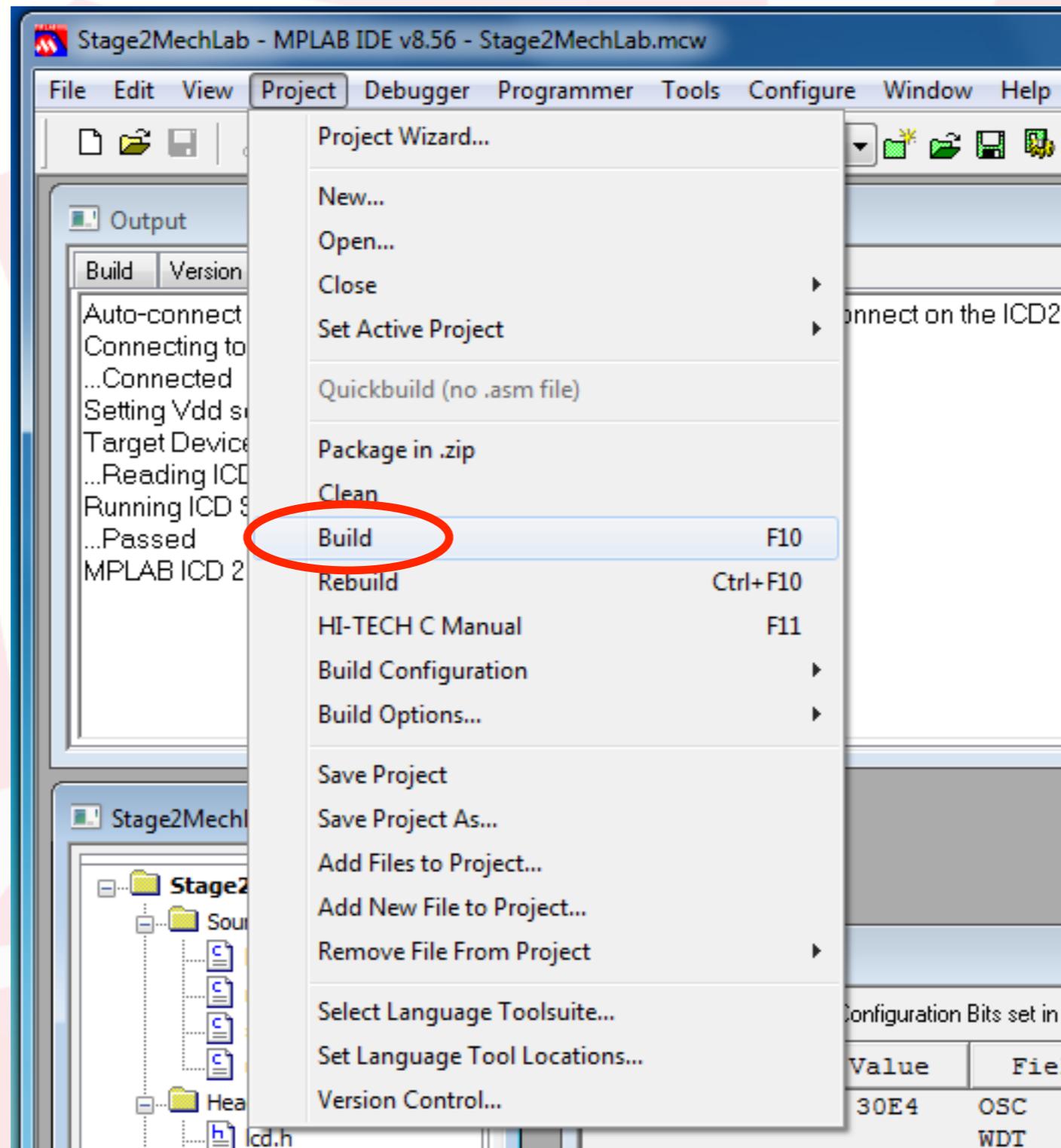


MPLAB IDE - Successful Connection to ICD2





MPLAB IDE - Stage2MechLab - Compiling





MPLAB IDE - Stage2MechLab - Compiling

The screenshot shows the MPLAB IDE interface with the following components:

- Toolbar:** The 'Release' button is circled in red.
- Checksum:** 0x9330
- Output Window:** Contains the following text:

```
Build Version Control Find in Files MPLAB ICD 2
program space used 741h ( 1857) of 2000h words ( 22.7%)
Data space used A6h ( 166) of 160h bytes ( 47.2%)
EEPROM space used 0h ( 0) of 100h bytes ( 0.0%)
Configuration bits used 1h ( 1) of 1h word (100.0%)
ID Location space used 0h ( 0) of 4h bytes ( 0.0%)

Running this compiler in PRO mode, with Omniscient Code Generation enabled,
produces code which is typically 40% smaller than in Lite mode.
The HI-TECH C PRO compiler output for this code could be 742 words smaller.
See http://microchip.htsoft.com/portal/pic_pro for more information.

Loaded H:\MPLAB\Stage2MechLab\Stage2MechLab.cof.

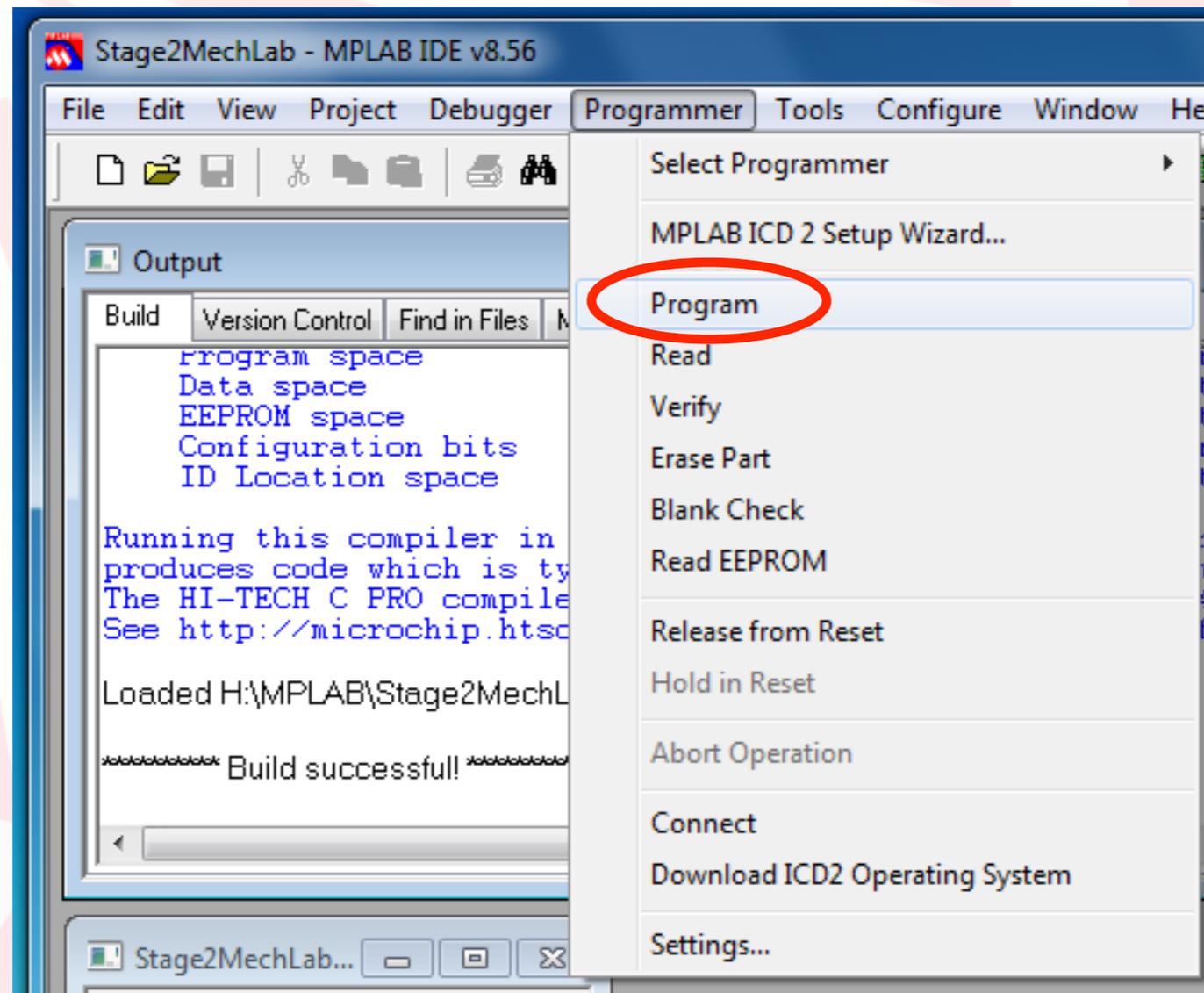
***** Build successful! *****
```
- Project Explorer:** Shows the project structure for 'Stage2MechLab.mcp', including Source Files (lcd.c, main.c, ser.c, user.c), Header Files (lcd.h, ser.h, user.h), Object Files, Library Files, and Other Files.
- Configuration Bits Window:** Shows the configuration settings for the PIC16F917. The 'Configuration Bits set in code' checkbox is checked. The table below lists the settings:

Address	Value	Field	Category	Setting
2007	30E4	OSC	Oscillator	INTOSCIO
		WDT	Watchdog Timer	Off
		PUT	Power Up Timer	On
		MCLRE	MCLR Pin Function Select	External
		CP	Code Protect	Off
		CPD	Data EE Read Protect	Off
		BODEN	Brown Out Detect	BOD And SBODEN Disabled
		IESO	Internal-External Switch Over	Disabled
		FCMEN	Fail Clock Monitor Enable	Disabled

At the bottom of the IDE, the 'MPLAB ICD 2' and 'PIC16F917' are circled in red.

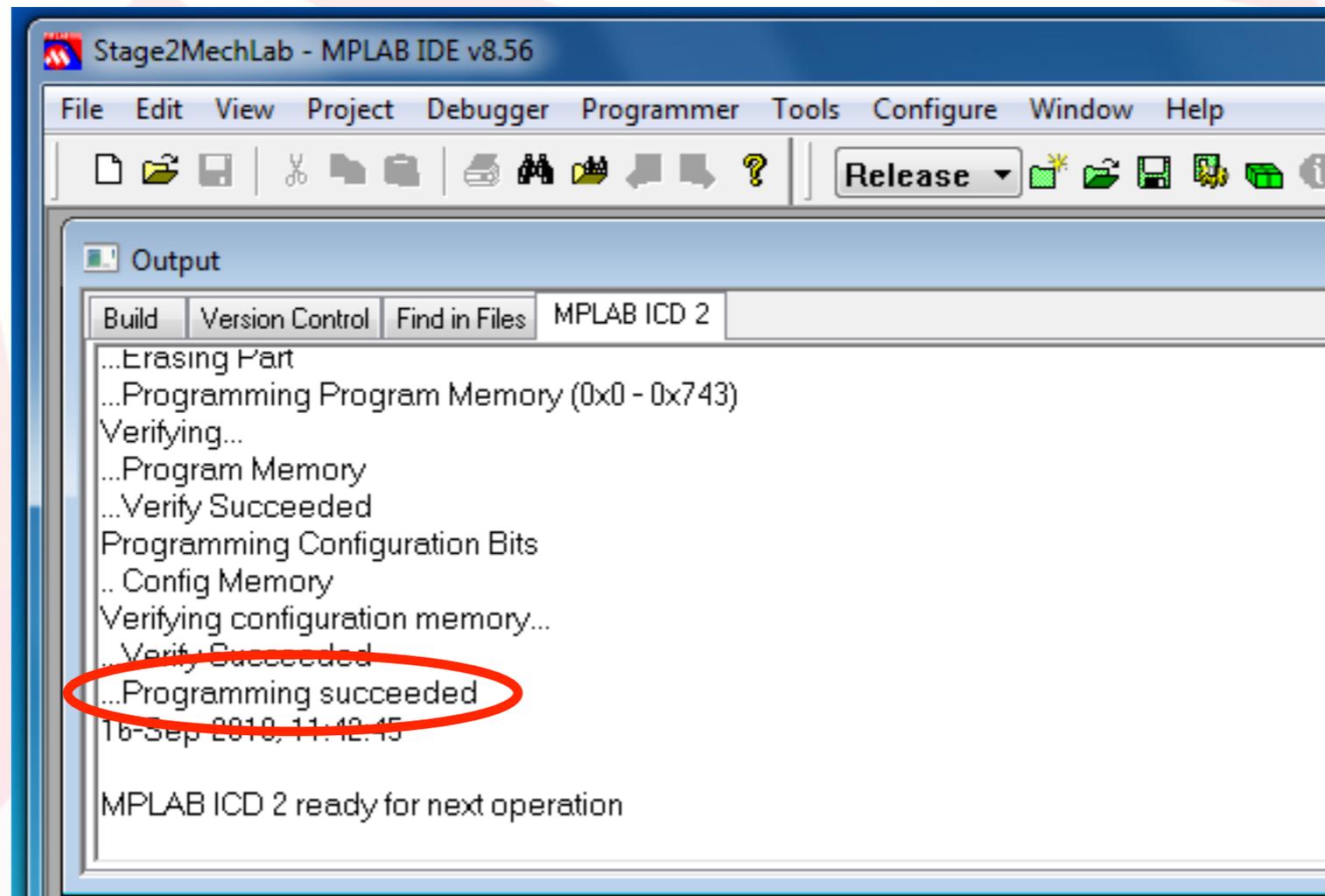


MPLAB IDE - Programming the PIC





MPLAB IDE - Programming the PIC

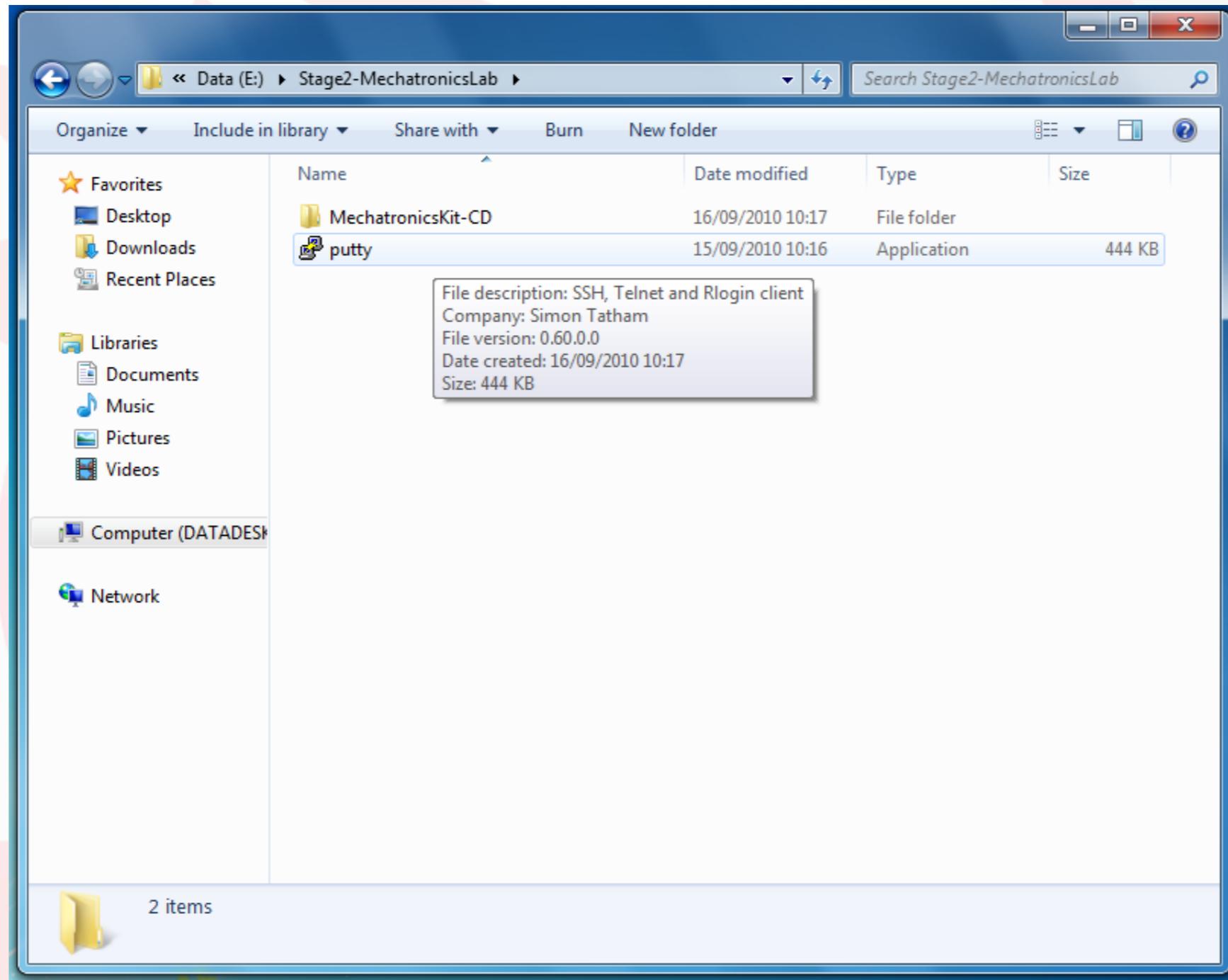


Carefully disconnect the ICD2 programmer from the Mechatronics board, and the program will start.



PuTTY - Connecting via the serial port

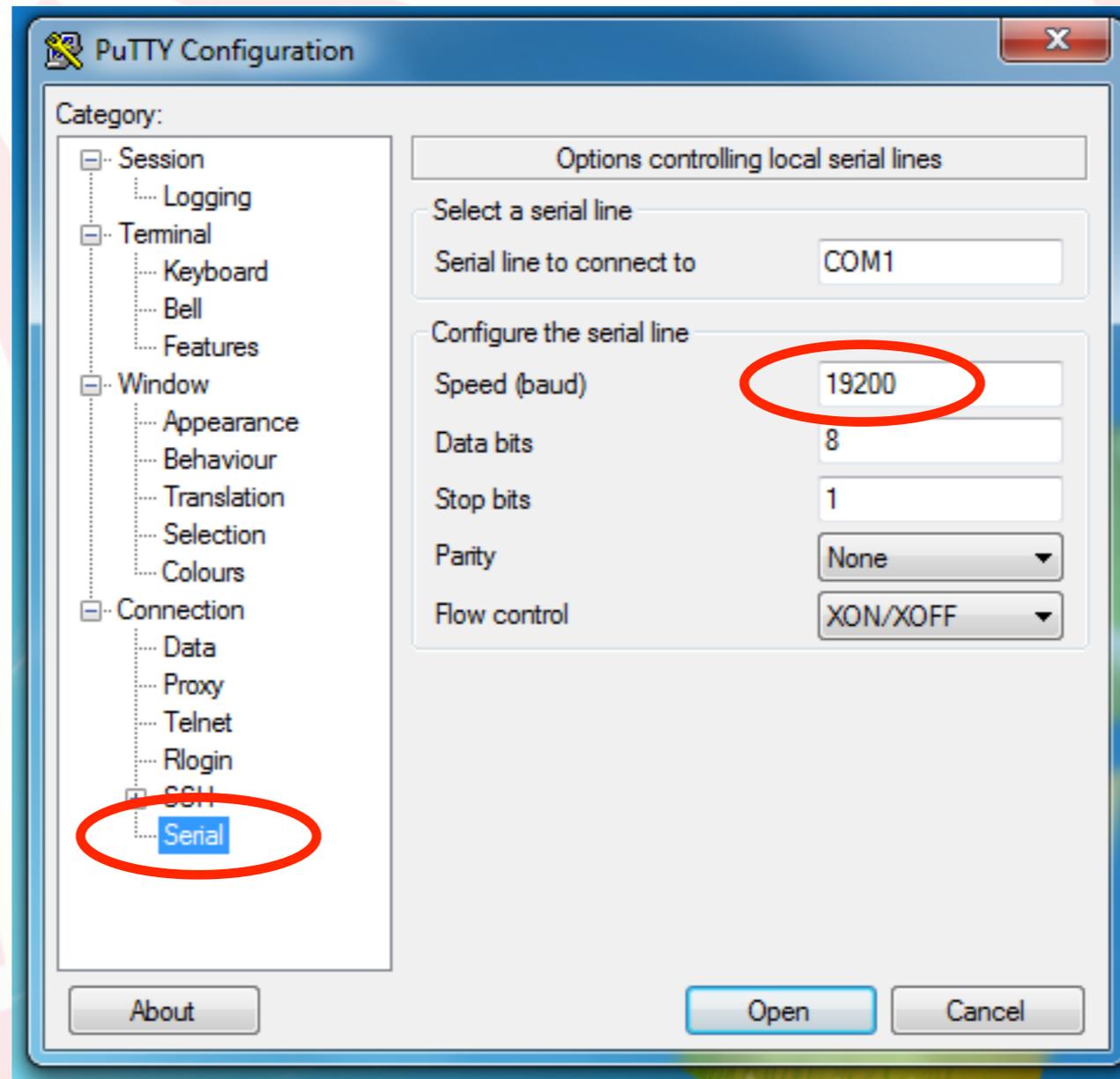
putty - Starting the Application





PuTTY - Connecting via the serial port

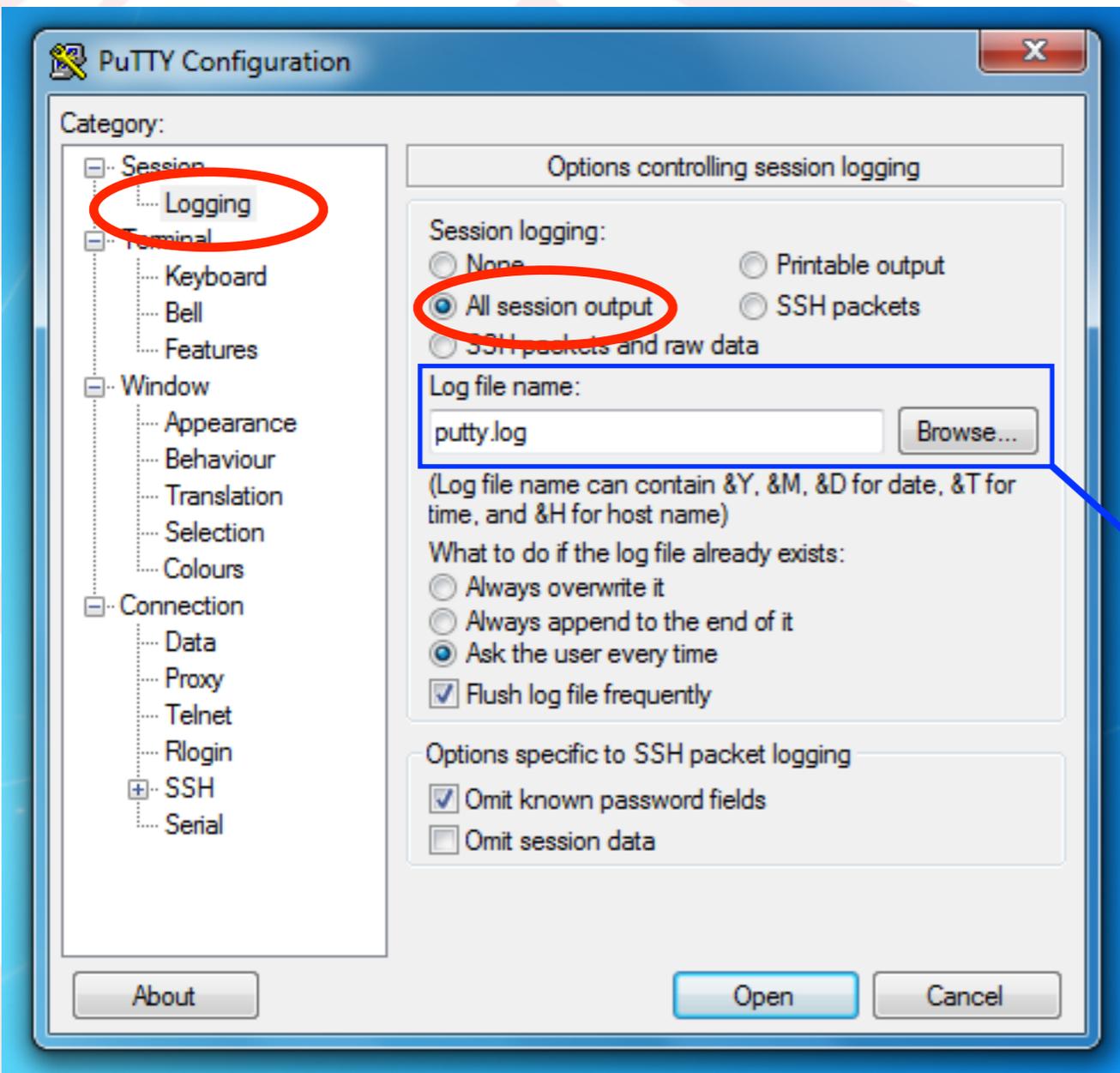
Step 1: Configuration - Connection - Serial





PuTTY - Connecting via the serial port

Step 2: Configuration - Session - Logging



PuTTY is a very useful program for communicating between computers, which may be connected over the internet or directly by a cable (as in this case).

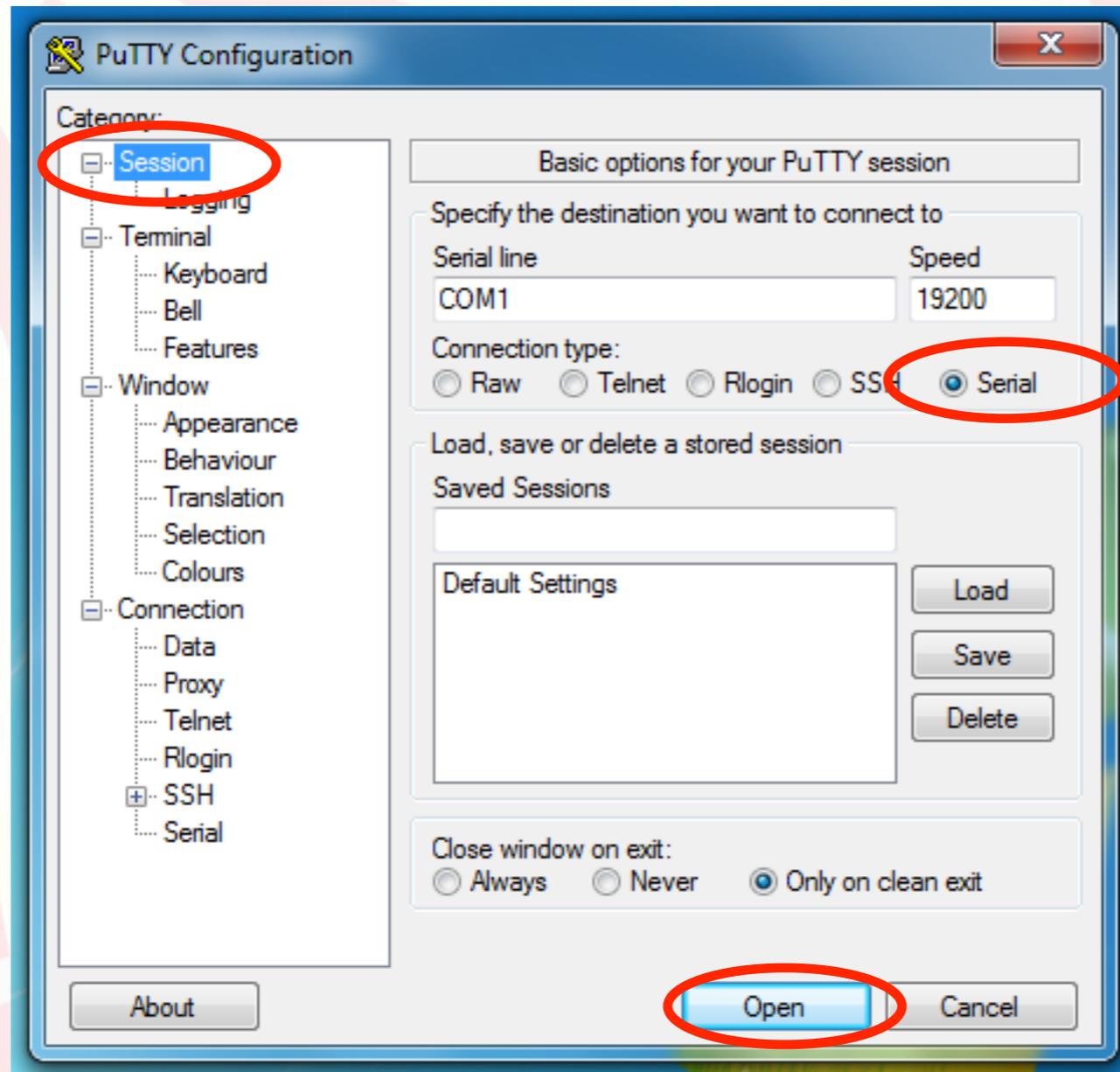
The communication can be ‘logged’ (saved to a file); this is done automatically, so there is no need to press a save button.

You can choose where to save the session; the default is ‘putty.log’ in the same folder as the PuTTY program.



PuTTY - Connecting via the serial port

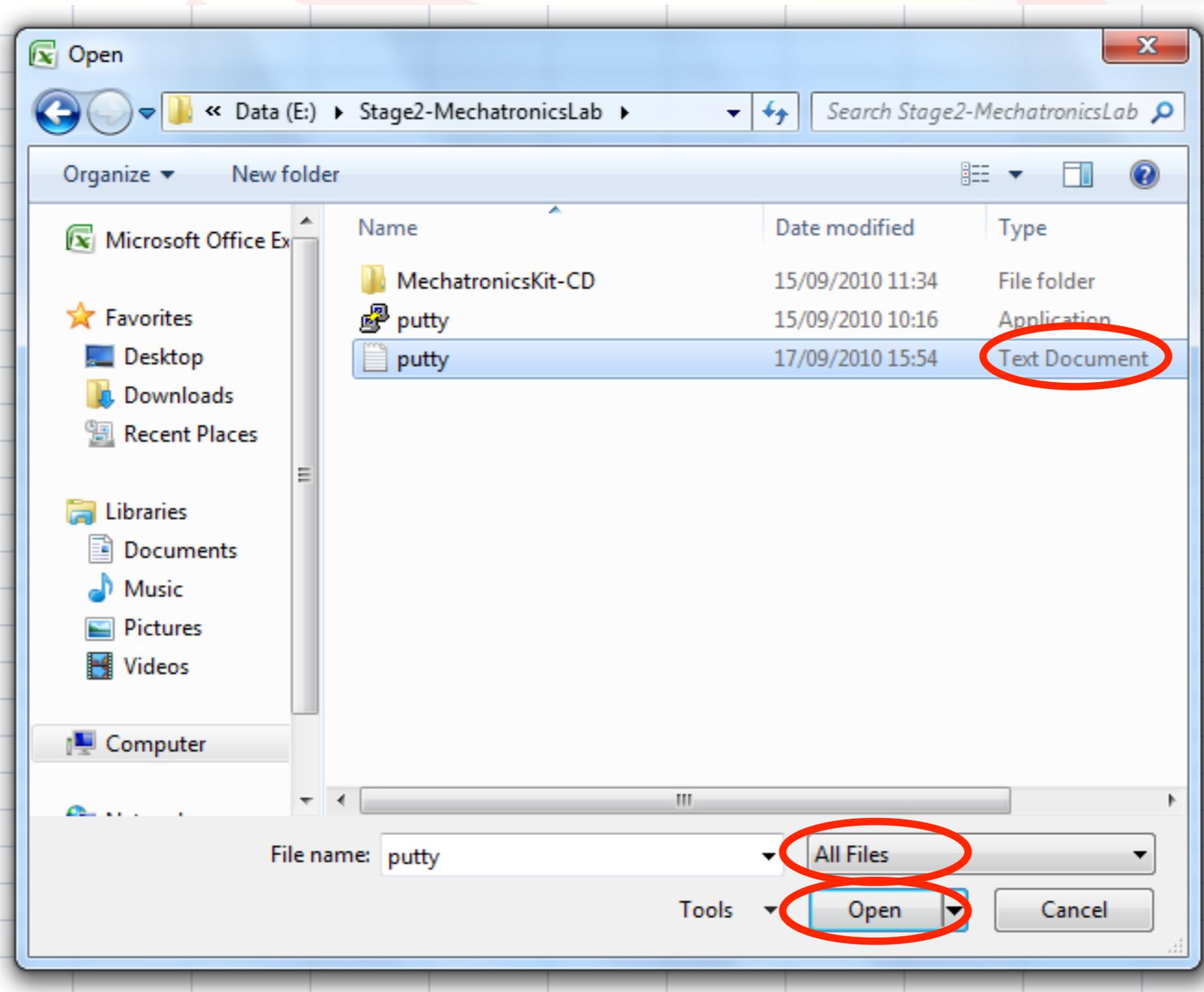
Step 3: Configuration - Session





Excel: Importing the session log

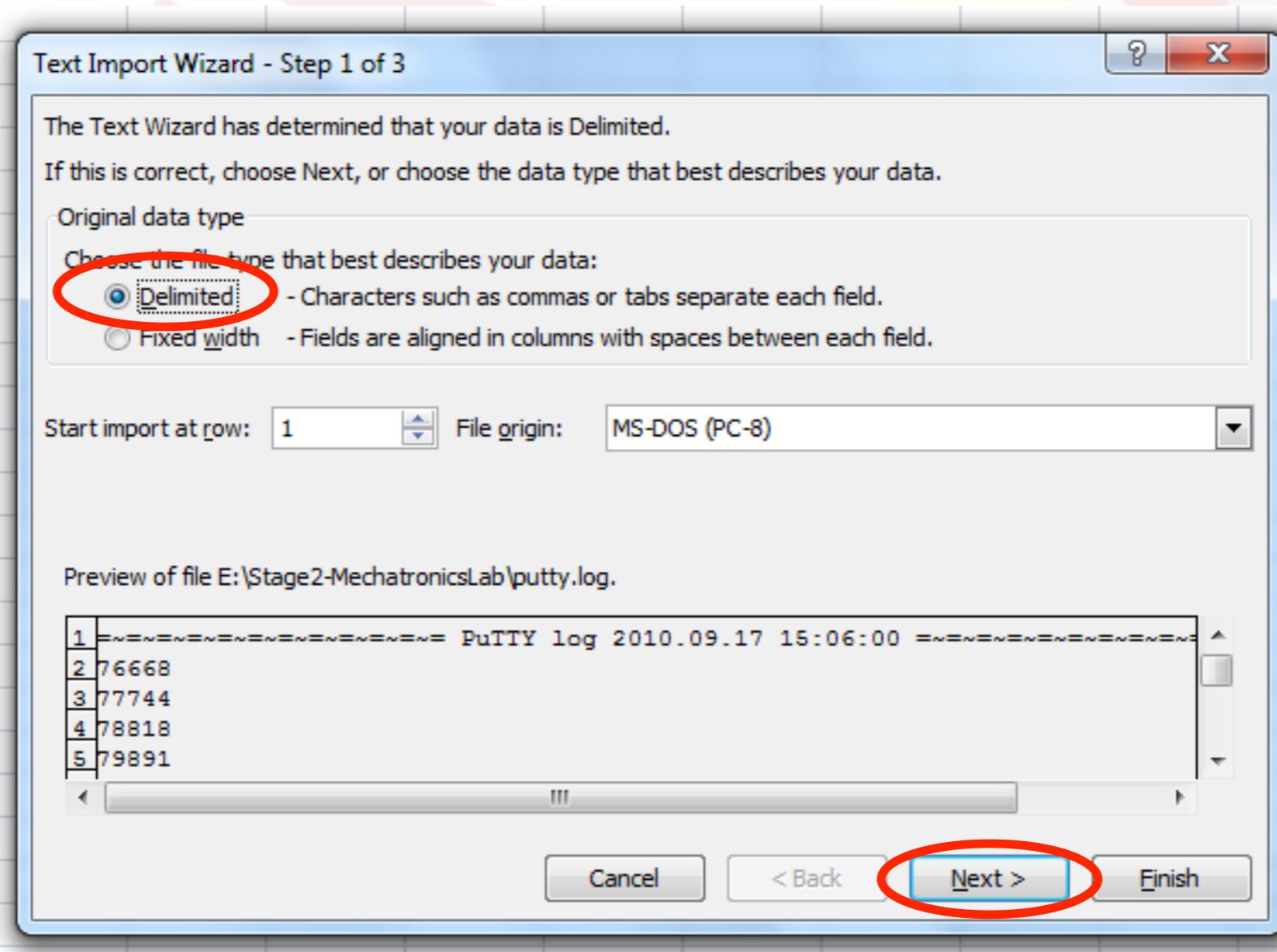
Step 1: File - Open...





Excel: Importing the session log

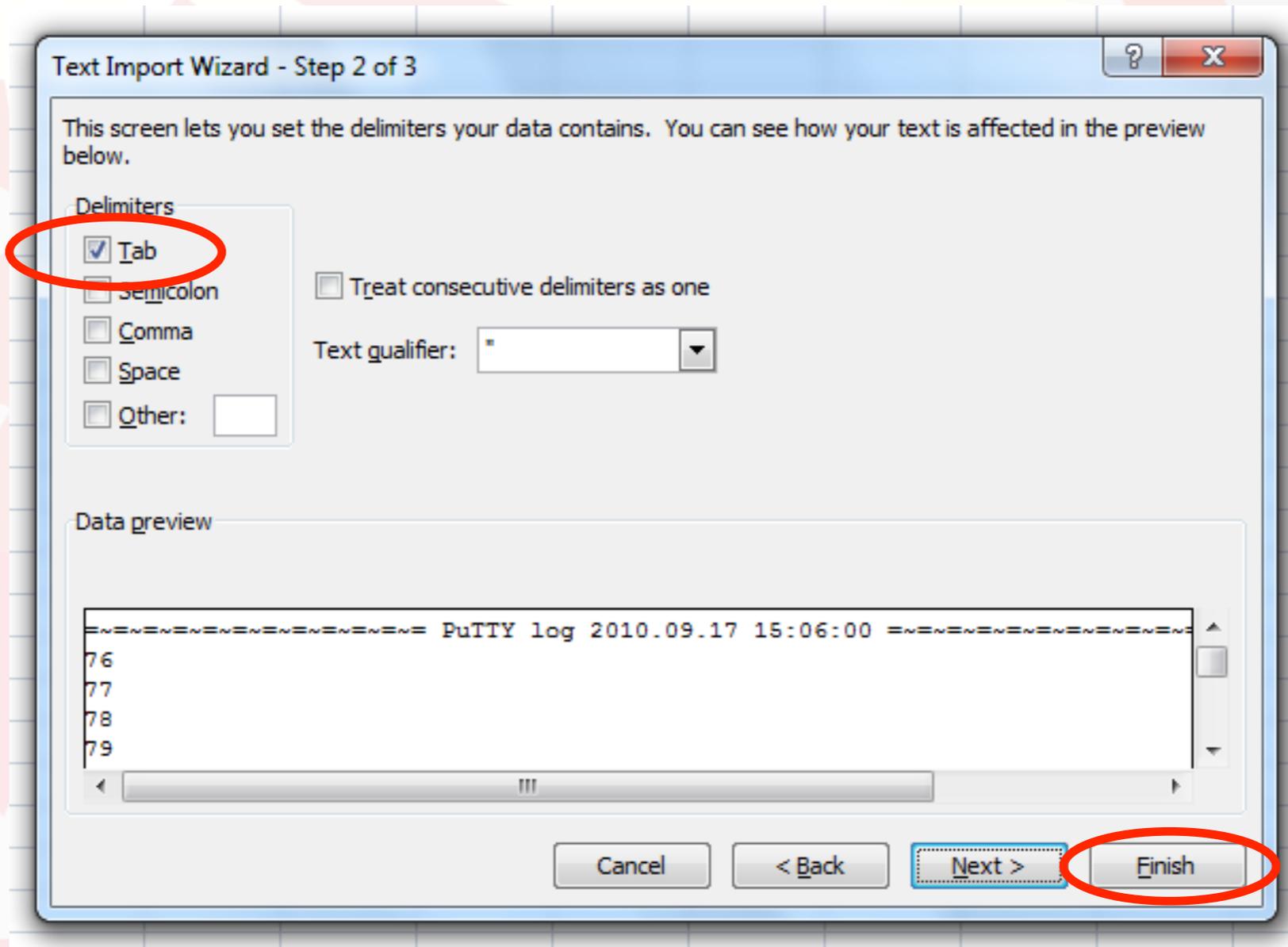
Step 2: Text Import





Excel: Importing the session log

Step 3: Text Import

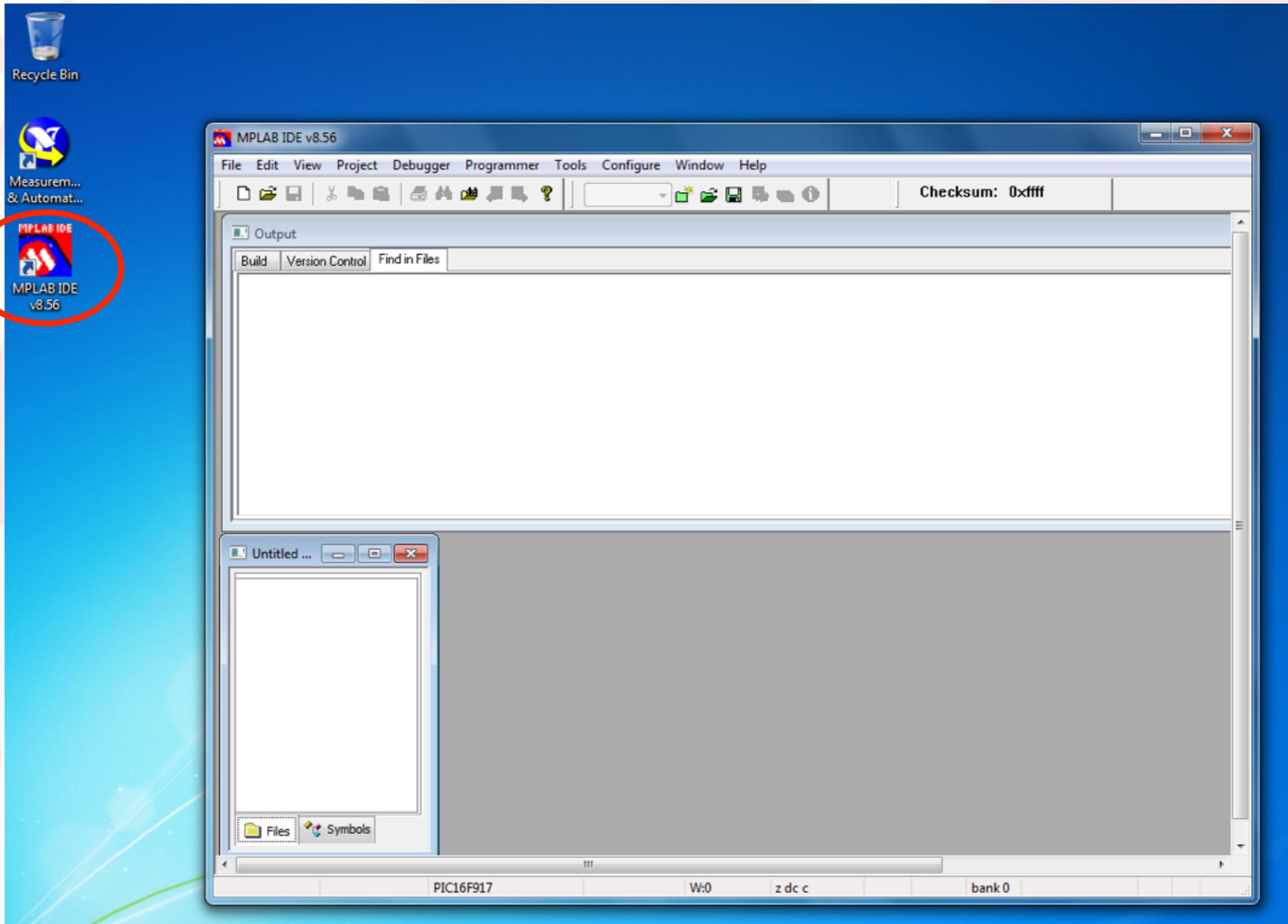




General Notes



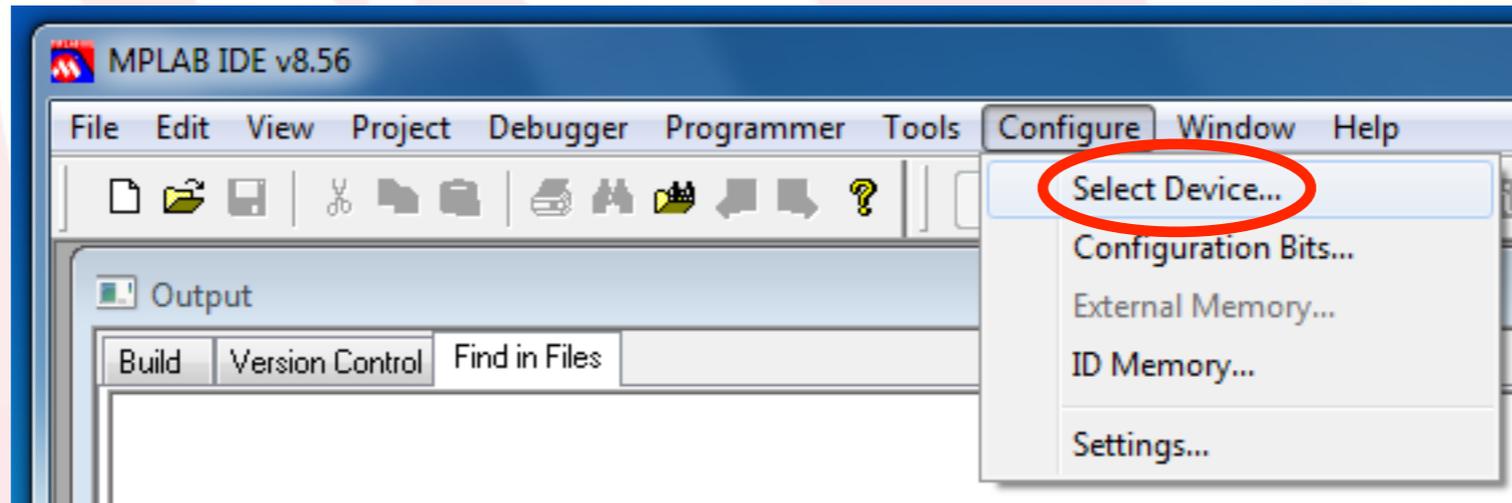
MPLAB IDE - Creating a new project





MPLAB IDE - Selecting the Chip (PIC)

The C code needs to be compiled into a binary form that the PIC microchip can understand. Since the C code does not define anything about the hardware, the compiler needs to know what PIC ('device') the final binary program will execute on.





MPLAB IDE - Selecting the Chip (PIC)

