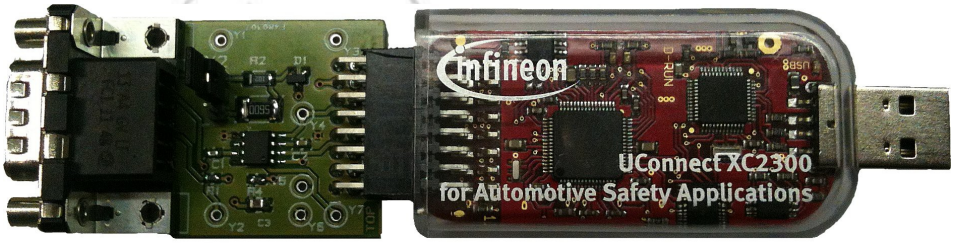
UCon_Lin Interface User Manual



Hw Version: UCon_Lin_Interface
Sw Version: 1.0.0

1. Summary

2. UCon_Lin overview

The UCon_Lin Interface is a very flexible device useful for the develop of ECU application with MKS2 Infineon Starter Kit.

The UCon_Lin Interface is presented as a single device (based on the Infineon UConnect develop board) but, for the truth, it is a two-in-one device.

Indeed it provides both a **PC-ECU** interface and a **Engine signals simulator**.

Via the PC-ECU interface, and by using the MecLab Calibration tool, it is possible to carry out each kind of comunication from the PC to the ECU board and vice versa: test the ECU, upload or download the calibration maps.

By using the Engine signals simulator the developer can test the ECU board in a several different operating conditions. The signals that can be simulated are: the square wave signal of the flywheel (OUT_FW) and the pressure wave analog signal of the intake manifold pressure sensor (OUT_DAC0).

The simulator can be set for generate the two signals independently or related to each other, in order to simulate the real engine conditions.

In fact, the developer can decide to vary both, the average speed of the flywheel (hence the average speed of the engine) and the average value of the analog signal, manually or according to a specific law. Is also possible to generate some noises into the flywheel signal, in order to simulate a eventual critical situations. The kinds of error that may be generated are: *one small pulse* between two teeth or *one tooth less*. For each kind of error it can be set the time interval between two successive error istances.

At last, for each signal there is the possibility to define the variation pattern on the 720 degrees.

All the simulator commands must be write in a script file by means of a simple and intuitive script language, and this makes it a fully configurable and flexible device.

Currently, the UCon_Lin Interface can manage only the K-line network (LIN BUS).

If You are interested to calibrate the MSK2 ECU using the CAN BUS network, please to contact Mectronik S.r.l.

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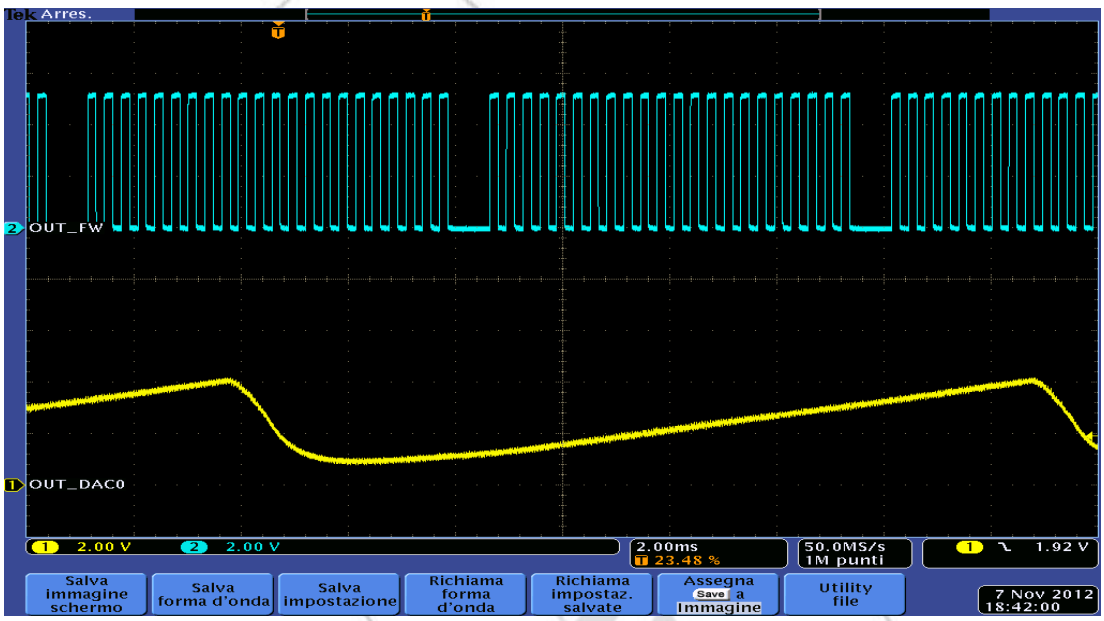
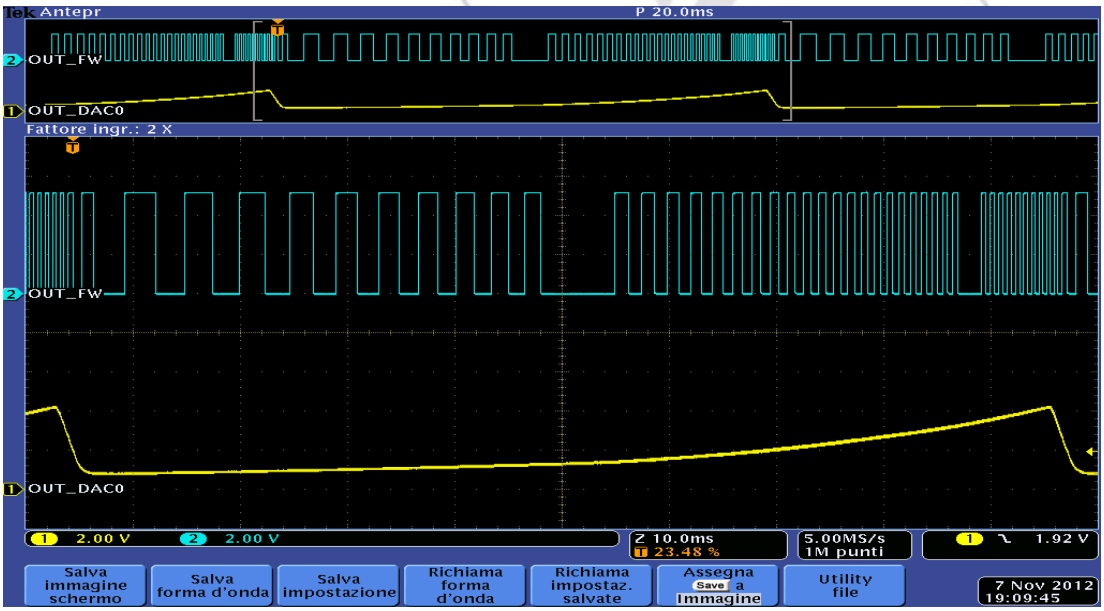
info@mectronik.com

2.1.1. Simulator: operation examples

Example 1: generation of flywheel and manifold pressur sensor signals.



Example 2: generation of flywheel and manifold pressur sensor signals in the case of simulated variation, over 720°, of the engine speed.



2.1.2. Minimum Hardware Requirements:

Processor: P4 Intel (Dual-core recommended)

RAM: 1GB

HD: 500MB free

Comunication ports: One free USB 2.0 port

NOTE: We recommended You to close every heavy application program on Your PC when You working with the UCon_Lin Interface (online mode). Otherwise the performance of the comunication between the PC and the UCon_Lin may deteriorate and the system may not operate correctly.

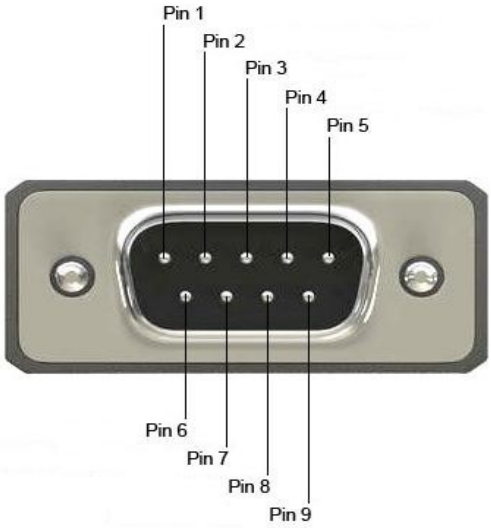
This behavior of the system arises from the FTDI VCP (Virtual COM Port) driver limitations.

2.1.3. Hardware link to Infineon MSK2 ECU:

The Ucon_Lin Interface is designed only for evaluation use in conjunction with the Infineon MSK2 ECU. Every further utilization is not warranted and supported.

Warning: Inputs and outputs are not opto-isolated, so we recommended You to refer to the Infineon UConnect Documents for the correct use of the interface.

2.1.3.1. UCon_Lin interface Pinout:



Pinout

PIN	Signal name	Signal description	I/O	Connected to	NOTE
1	OUT_DAC0	Manifold absolute pressure sensor	Output	pin 28 MSK2 connector	0 ¸ 5 volt
2	CAN_L	CAN BUS, low line	I/O		
3	GND	Main ground		MSK2 GND Power	
4	N.C.	Not used			
5	GND	Screen ground			
6	LIN BUS	K-line / LIN line	I/O	pin 34 MSK2 connector	0 ¸ 12 volt
7	CAN_H	CAN BUS, high line	I/O		
8	OUT_FW	Flywheel signal	Output	pin 14 MSK2 connector	0 ¸ 5 volt
9	+VBAT	Power supply	Input	MSK2 Power supply	8 ¸ 13 volt

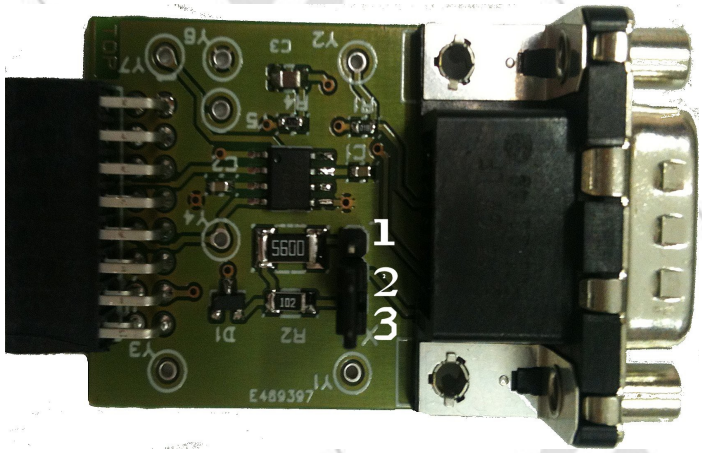
The VRS_A pin of the MSK2 ECU (pin 31) must be left open.

Warning: during the installation and the operation of the UCon_Lin Interface, You have to be careful to avoid the ground-loop in wiring connections.

In order to permit the correct operation of the Infineon MSK2 ECU flywheel sensor input, when it is connected with the simulated signal, You must properly set the parameters of the pickup sensor, using the MecLab Calibration software, in accordance with the following table.

2.1.3.2. Jumper setting

The jumper situated on the top side of the board allows You to set the pull-up resistor value for the K/LIN line output pin. In this way the UCon_Lin Interface become K-line or LIN compliant.



Jumper position	Description
1 – 2	pin 6 pull-up resistor (1 Kohm LIN compliant)
2 – 3	pin 6 pull-up resistor (560 ohm ISO 9141 compliant)

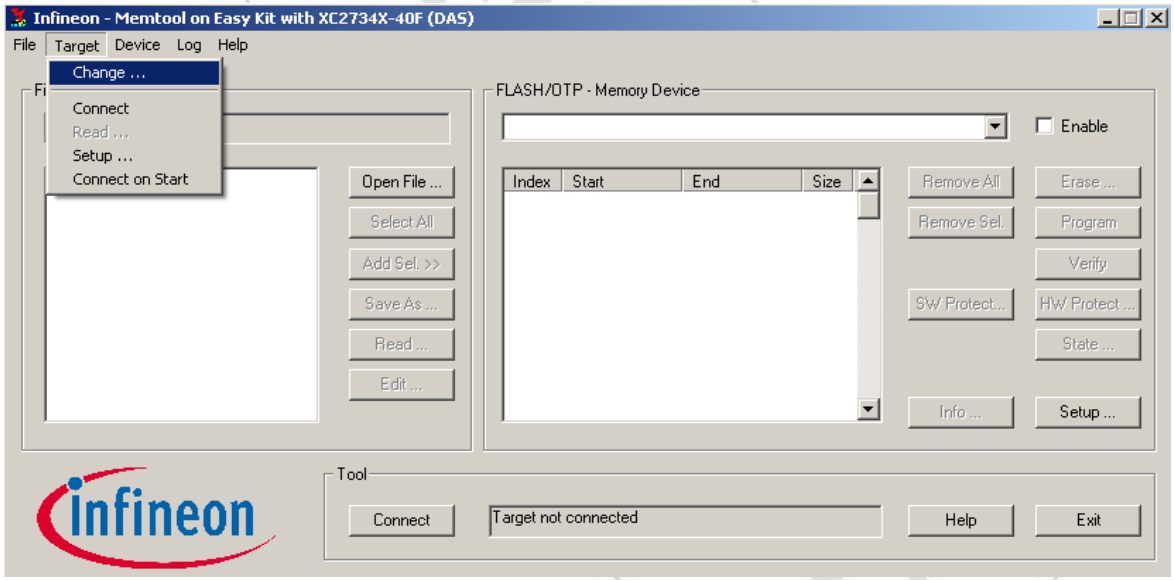
For use with MecLab software for the MSK2 ECU calibration, we recommended You to move the jumper in the 2 – 3 position (K-line ISO 9141 diagnostic mode).

3. Making UCon_Lin Interface the UConnect board

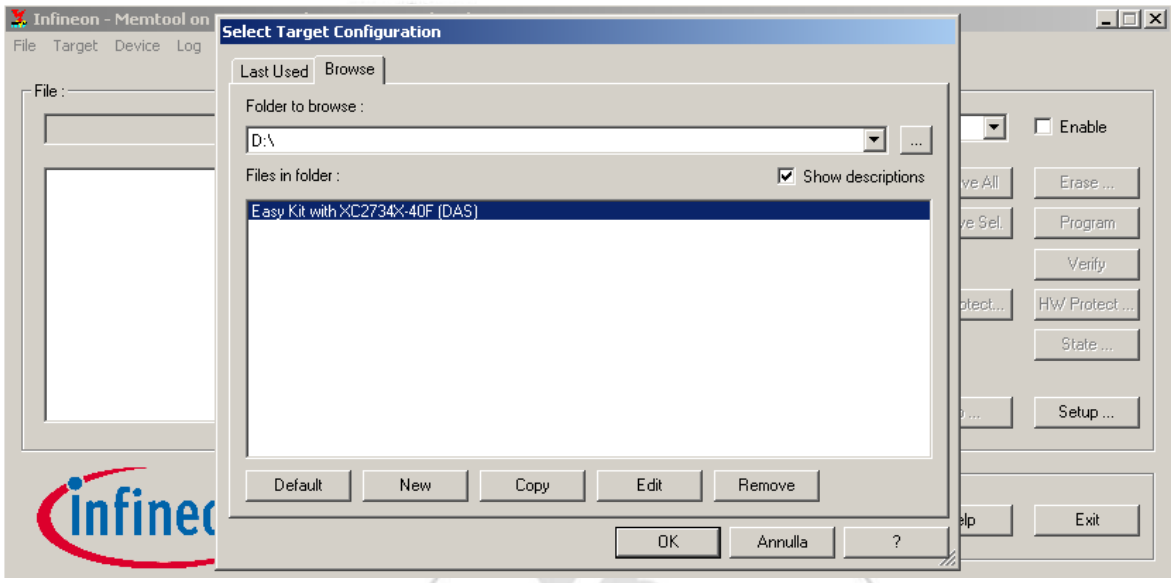
In order to use the Infineon UConnet develop board like UCon_Lin Interface, the respective firmware needs to be loaded in the UConnect flash memory.

For a succesful flash programming on the Infineon UConnect board, the following steps should be done:

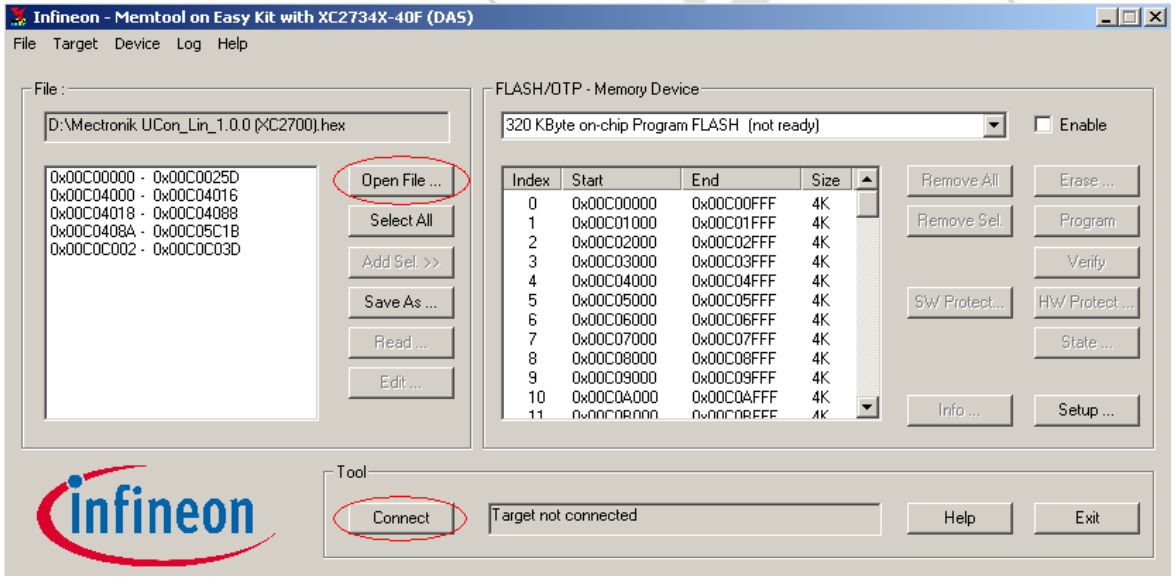
1: Start the Infineon Memtool program (if it is not installed proceed to do so) and click on the “Target” menu and then click on the item “Change ...”



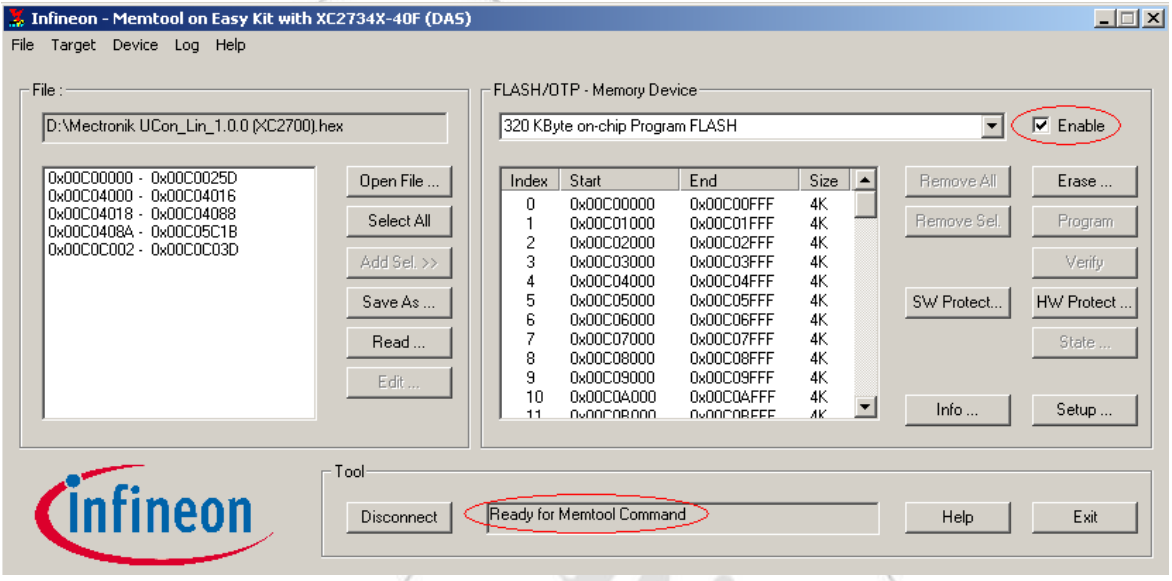
2: In the “Select Target Configuration” window choose the folder containing the file named “Easykit_XC2734X-40F_das.cfg”, select it and click “OK”.



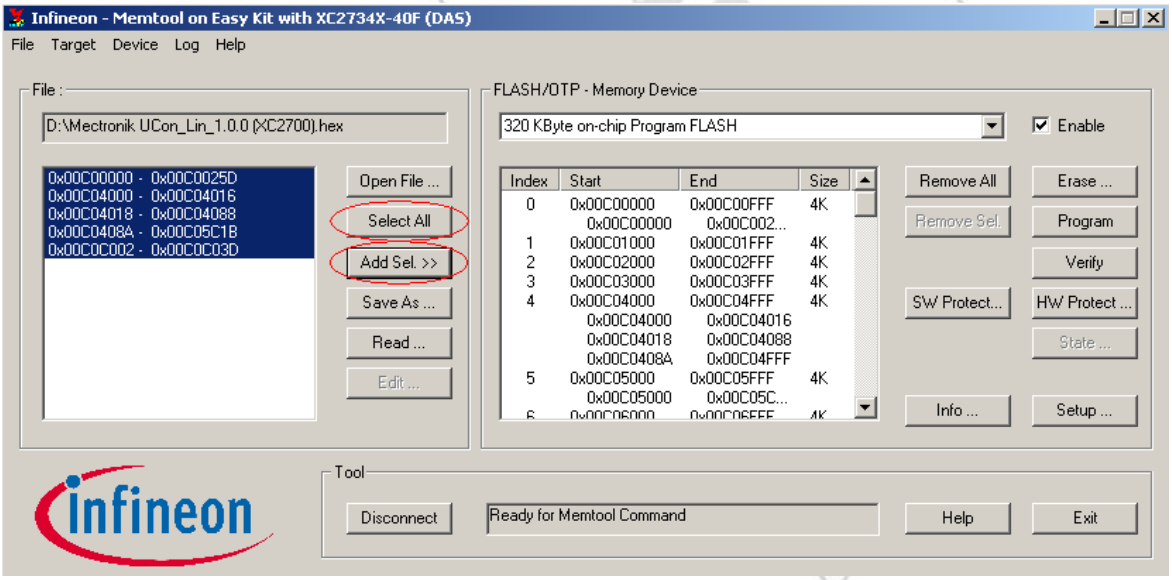
3: Returned to the main window, click on the “Open File ...” button on the left and open the file named “Mectronik UCon_Lin_1.0.0 (XC2700).hex”.
Then plug the Infineon Uconnect board in the usb and click the “Connect” button at the bottom.



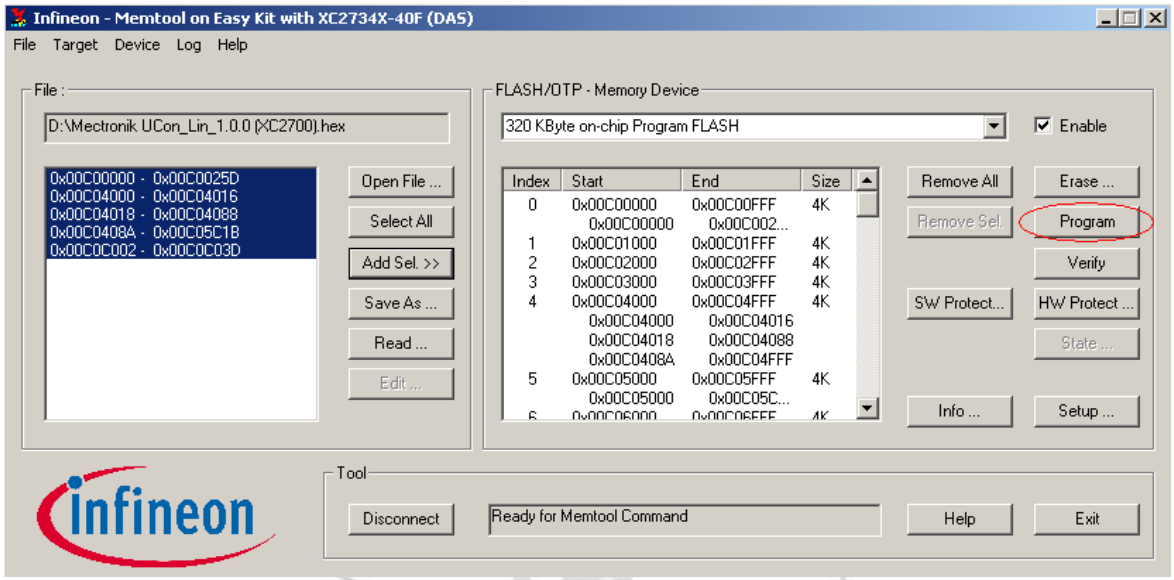
4: Wait a few second and, if the process is succesful, the message “Ready for Memtool Command” will appear. If the “Enable” box is not checked, proceed to do so. At this point You are ready for upload the flash.



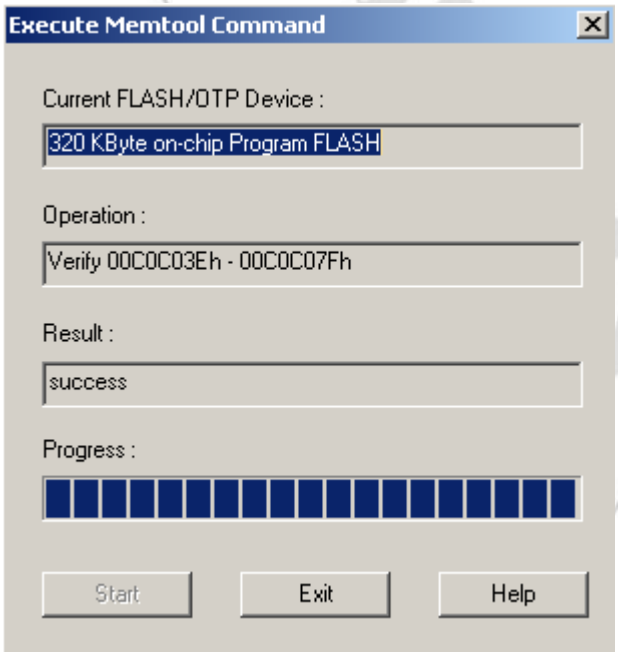
5: Click the “Select All” botton on the left and then click the “Add Sel. >>” button.



6: Now You can click the “Program” button in order to write the flash memory.



7: The “Execute Memtool Command” window will appear and You can monitor the results of the operation. When the word “success” will appear then the flash programming will be complited.



8: Click the “Exit” button and close the Infineon Memtool Program.

9: Disconnect and reconnect the Infineon UConnect board on the usb port.

10: The UCon_Lin Interface is ready to be used.