

UCon_Lin Interface User Manual



Hw Version: UCon_Lin_Interface Sw Version: 1.0.0

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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.I.



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.



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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.

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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	6.
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	$\langle \rangle$	
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.

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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).

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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 ..."

📕 Infineon - Memtool on Easy Kit with	XC2734X-40F (DAS))			_ 🗆 🗙
File Target Device Log Help		- ELASH/OTE - Memory Device			
Connect Read				•	🗖 Enable
Connect on Start	Open File	Index Start End	Size 🔺	Remove All	Erase
	Select All			Remove Sel.	Program
	Add Sel. >>				Verify
	Save As			SW Protect	HW Protect
	Read				State
	E dit				
			•	Info	Setup
19 miles	_ Tool	J			
Infineon	Connect	Target not connected		Help	Exit



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

👗 Infineon - Memtool on 🛛	Select Target Configuration		_ 🗆 🗙
File Target Device Log	Last Used Browse Folder to browse :	•	Enable
	Files in folder :	ve All	Erase
	Easy Kit with XC2734X-40F (DAS)	ve Sel.	Program
			Verify
		otect	HW/ Protect
		J	State Setup
infined	Default New Copy Edit Remove Default New Copy Edit Remove OK Annulla ? ////////////////////////////////////	elp	Exit

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.

Jinfineon - Memtool on Easy Kit with File Target Device Log Help	XC2734X-40F (DA5)						_ 🗆 🗙
File :	.hex Open File Select All Add Sel. >> Save As Read Edit	FLASH/C 320 KB; 0 1 2 3 4 5 6 7 8 9 10	TP - Memory Dev yte on-chip Progra Start 0x00C00000 0x00C01000 0x00C02000 0x00C02000 0x00C02000 0x00C02000 0x00C02000 0x00C02000 0x00C05000 0x00C05000 0x00C05000 0x00C05000 0x00C05000 0x00C05000 0x00C05000 0x00C08000 0x00C08000 0x00C08000 0x00C08000 0x00C08000 0x00C08000	Ince m FLASH (not re 0x00C00FFF 0x00C01FFF 0x00C02FFF 0x00C03FFF 0x00C03FFF	ady) Size 4K 4K 4K 4K 4K 4K 4K 4K 4K 4K 4K 4K 4K	Remove All Remove Sel. SW Protect	Erase Program Verify HW Protect State
infineon	Connect	Target no	t connected			Help	Exit

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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.

	1	- No.						
📕 Infineon - Memtool on Easy Kit with	XC2734X-40F (DA5	j)						
File Target Device Log Help								
File :		T FLASH/O	ITP - Memory Dev	/ice				
D:\Mectronik UCon_Lin_1.0.0 (XC2700)	hex	320 KBy	te on-chip Progra	m FLASH				Enable
			. 2					
0x00C00000 - 0x00C0025D	Open File	Index	Start	End	Size		Remove All	Erase
0x00C04000 - 0x00C04016 0x00C04018 - 0x00C04088 0x00C0408A - 0x00C05C1B	Select All	0	0x00C00000 0x00C01000	0x00C00FFF 0x00C01FFF	4K 4K		Remove Sel.	Program
0x00C0C002 - 0x00C0C03D	Add Sel. >>	3	0x00C02000 0x00C03000	0x00C02FFF 0x00C03FFF	4K 4K			Verify
		4	0x00C04000	0x00C04FFF	4K			
	Save As	6	0x00C06000	0x00C05FFF	4K 4K		SW Protect	HW Protect
	Read	7	0x00C07000	0x00C07FFF	4K			State
		9	0x00C08000	0x00C08FFF	4K 4K			
	Edit	10	0x00C0A000	0x00C0AFFF	4K	-		Cabin
1			0-00008000	0v00C0RFFF	лк		Inito	
Cintineon	Disconnect	Ready for	Memtool Comman	nd			Help	Exit
		1		-				

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

File : D:Mectronik UCon_Lin_1.0.0 (XC2700).hex D:Mectronik UCon_Lin_1.0.0 (XC2700).hex Image: Start D:Moctool0318 0.000C04006 D:MOCC00000 0.000C04006 D:MOCC00000 0.000C04006 D:MOCC00000 0.000C04076 D:MOCC040000 0.000C04076 D:MOCC040000 0.000C04076 D:MOCC040000 0.000C04076 D:MOCC04000 0.000C04767 D:MOCC04000 0.000C04767 D:MOCC04000 0.000C04767 D:MOCC04000 0.000C04767 D:MOCC04000 0.000C04767 D:MOCC04000 0.000C04767 <t< th=""><th>💃 Infineon - Memtool on Easy Kit with XC2734X-40</th><th>F (DAS)</th><th></th><th></th><th></th><th></th><th></th><th></th></t<>	💃 Infineon - Memtool on Easy Kit with XC2734X-40	F (DAS)						
File : D:\Mectronik UCon_Lin_1.0.0 (XC2700).hex 0:\Mectronik UCon_Lin_1.0.0 (XC2700).hex Index Stat 0:\Method UCON_UCON_UCON_UCON_UCON_UCON_UCON_UCON_	File Target Device Log Help							
0x00C00000 • 0x00C00250 0x00C04001 • 0x00C04016 0x00C04008 • 0x00C05518 Open File Index Statt End Size Remove All Erase Erase Program 0 0x00C00000 0x00C00000 0x00C0022 Remove All Erase Program 1 0x00C00000 0x00C022FFF 4 K Verify Save As Verify 3 0x00C04000 0x00C04008 0x00C04018 0x00C04018 SW Protect Hw Protect 0 0x00C04000 0x00C055FFF 4 K Swe As State Swe Protect	File :	FLA	ASH/OTP - Memory De 20 KByte on-chip Prog	am FLASH			<u> </u>	🔽 Enable
0x00004018 · 0x0000018 · 0x000005018 0x00004018 · 0x00000518 0x0000000 · 0x0000000 0x0000000 · 0x0000000 · 0x0000000 0x0000000 · 0x000000 · 0x000000 · 0x0000000 0x000000 · 0x000000 · 0x000000 · 0x0000000 · 0x0000000 0x000000 · 0x00000 · 0x000000 · 0x000000 · 0x0000000 · 0x0000000 · 0x0000000 · 0x000000 · 0x000000 · 0x0000000 · 0x000000 · 0x0000000 · 0x000000 · 0x000000 · 0x000000 · 0x000000 · 0x0000000 · 0x000000 · 0x0000000 · 0x000000 · 0x0000000 · 0x000000 · 0x0000000 · 0x0000000 · 0x0000000 · 0x0000000 · 0x000000 · 0x000000 · 0x000000 · 0x0000000 · 0x00000000	0x00C00000 - 0x00C0025D Open F	ile	ndex Start	End	Size		Remove All	Erase
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3 0x00C03000 0x00C03FFF 4K Save As 4 0x00C04000 0x00C040FFF 4K 0x00C04000 0x00C04016 0x00C04018 SW Protect 0x00C04018 0x00C04088 0x00C04088 State 0x00C05000 0x00C05FFF 4K State 0x00C05000 0x00C05000 0x00C05FFF 4K 0x00C05000 0x00C05000 0x00C05FFF 4K 0x00C05000 0x00C055C av Info Setup Tool	0x00C0408A - 0x00C05C18 0x00C0C002 - 0x00C0C03D		1 0x00C01000 2 0x00C02000	0x00C01FFF 0x00C02FFF	4K 4K			Verify
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Read 0x00C04018 0x00C04088 Dx00C04018 0x00C04088 State Edit 5 0x00C05000 0x00C05000 0x00C05000 0x00C05000 0x00005000 0x00C05000	Save A		4 0x00C04000 0x00C0400	0x00C04FFF 0 0x00C04016	4K		SW Protect	HW Protect
Edit 5 0.000C05000 0.000C05FFF 4K 0x00C05000 0x00C05FF 4K Info Setup infineon Disconnect Ready for Memtool Command Help Exit	Read		0x00C0401	3 0x00C04088				State
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Disconnect Ready for Memtool Command Help Exit	Tool							
		nect Rea	adv for Memtool Comma	and			Help	Exit
			•					

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

🥈 Infineon - Memtool on Easy Kit with	XC2734X-40F (DA5)					_ 🗆 ×
File Target Device Log Help							
File : D:\Mectronik UCon_Lin_1.0.0 (XC2700). 0x00C00000 - 0x00C0025D 0x00C04000 - 0x00C04016 0x00C04018 - 0x00C05C18 0x00C04084 - 0x00C05C18 0x00C0C002 - 0x00C0C03D	hex Open File Select All Add Sel. >> Save As Read Edit	FLASH/0 320 KB, 0 1 2 3 4 5 5	DTP - Memory Dev yte on-chip Program Start 0x00C00000 0x00C00000 0x00C00000 0x00C00000 0x00C03000 0x00C03000 0x00C04000 0x00C04000 0x00C04000 0x00C04000 0x00C04000 0x00C04000 0x00C04000	End 0x00C00FFF 0x00C002 0x00C002 0x00C01FFF 0x00C04FFF 0x00C04FFF 0x00C04016 0x00C04018 0x00C04018 0x00C04018 0x00C04FFF 0x00C05FFF 0x00C05FFF 0x00C05FFF	<u>Size</u> 4К 4К 4К 4К 4К 4К	Remove All Remove Sel. SW Protect	Erable Erase Program Verify HW Protect State Setup
Cinfineon	Disconnect	Ready for	Memtool Comman	d		Help	Exit

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.

Execute Memtool Command	×
Current FLASH/OTP Device :	
320 KByte on-chip Program FLASH	
Operation :	
Verify 00C0C03Eh - 00C0C07Fh	
Result :	1/
success	
Progress :	
	1
Start Exit Help	

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- 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.

