



FAQ Software

MOTIX[™] Embedded Power ICs based on Arm[®] Cortex[®]-M

About this document

Scope and purpose

This document is intended to answer frequently asked questions regarding software topics in the context of programming MOTIX[™] Embedded Power devices and related tools.

Intended audience

Software engineers, embedded power designers, application engineers



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1.1 Code completion

By default, Keil uVision offers an auto-completion feature. Sometimes the feature is not visible, e.g. when the cursor is changed to another position and then put back. It appears again by placing the cursor to the position to auto-complete and then by clicking **Ctrl + Space**. Then an alphabetical list of suggestions is shown.

			n c*	mai		main c*			
<pre>main(void) Initialization of hardware modules based of E_Init(); Start PWM generation */ U6_StartTmr_T12(); U6_Re U6_PSLR_PSL63_Msk U6_PSLR_PSL63_Pos U6_PSLR_PSL_Msk U6_PSLR_PSL_Msk U6_PSLR_PSL_Pos U6_PSLR_PSL_Pos U6_ReadHallReg U6_ReadMultichannelPatterns U6_SetT12T13ControlBits U6_SetT13Compare U6_SetT13Trigger</pre>	ia t t s t s LR s LR s LR s LR s LR s LR s	/* Ini TLE_Ir /* Sta CCU6_S CCU6_I CCU6_I CCU6_I CCU6_I CCU6_I CCU6_S CCU6_S	in { { •	61 62 [63 64 65 66 67 68 69 70 [71 72 73 74 75 76	×	62 ☐ { 63	alization of har (); PWM generation artTmr_T12(); LR_PSL63_Msk LR_PSL63_Pos LR_PSL_Msk LR_PSL_Pos adHallReg adMultichannelPat T12T13ControlBit T13Compare	/ erns	i on

Figure 1 Auto-completion in Keil uVision

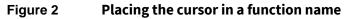
When typing, the suggestions change based on the current text. They can be refined by adding more letters to specify the function or variable as well as extended by removing text.



1.2 Help with F1

We offer a help for the functions and types used in the SDK. This help can be accesses by placing the cursor into the name or marking it and then clicking F1.

<pre>/* Start PWM generation */</pre>
CCU6_StartTmr_T12();



After clicking F1, the web browser opens and displays the help for the selected function/type. For functions, the following items are described:

- Short description
- Parameters
- Return value
- Optional: Short example where the function is used

For types or macros, the following items are described:

- Description
- Further details if applicable

TLE987x Device Family SDK: ccu6 × +	-	×
\leftarrow \rightarrow C $$ (i) File C:/Keil_v5/ARM/ $$ C	¢	
◆ CCU6_StartTmr_T12()		*
INLINE void CCU6_StartTmr_T12 (void)		
Start CCU6 Timer T12.		
Example		
This example starts CCU6 Timer T12.		
<pre>void Example_Function(void) { CCU6_StartTmr_T12(); }</pre>		

Figure 3 F1 Help for the function CCU6_StartTmr_T12()

Within the help, it is also possible to browse and access the help for other functions.



SDK Help and general documentation 1.3

You can access the SDK help and the general documentation in the section **Books** of your project.

The **SDK Help** is intended to give you an overview of the release notes (from the current and older pack versions), as well as some tips regarding the creation of a project from scratch or the change of the target device for example.

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🕀 🎁 Tools User's Guide	1 🖂 / *
🗄 🎁 Device Data Books	2 *************
TLE987x Series Reference Manual	3 *
TLE987x BE-Step Series BootROM Manual	4 * Copyright (c) 2
TLE987x BF-Step Series BootROM Manual	5 * All rights rese
TLE9879QXA40 Data Sheet - BE-Step	6 *
TLE9879QXA40 Data Sheet - BF-Step	7 * Redistribution
SDK Help	8 * following condi 9 *
Board Data Books	10 * Redistributio
Getting Started (TLE9879 EvalKit)	11 * disclaimer.
Schematics (TLE9879 EvalKit)	12 *
TLE9879 EvalKit Web Page (TLE9879 EvalKi	13 * Redistributio
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< >	23 * SERVICES; LOSS 24 * WHETHER IN CONT

General documentation in the tab Books in Keil uVision Figure 4



1.4 How to use a fixed pack version

Per default, a project runs with the latest installed pack of the used chip. You still have the possibility to use an older fixed pack.

To do so, click on the icon *, which opens the *Manage Run-Time Environment* window. To change the pack version, select *Select Packs* at the bottom.

🔣 Manage Run-Time Environment					×
Software Component	Sel.	Variant		Version	Description
😥 🚸 CMSIS					Cortex Microcontroller Software Interface Componer
🖶 🚸 CMSIS Driver					Unified Device Drivers compliant to CMSIS-Driver Sp
🗄 💠 Compiler		ARM Compiler		1.6.0	Compiler Extensions for ARM Compiler 5 and ARM C
🖶 🚸 Device					Startup, System Setup
🖶 🚸 File System		MDK-Plus	\sim	6.14.1	File Access on various storage devices
Graphics		MDK-Plus	\sim	6.16.3	User Interface on graphical LCD displays
🗄 💠 Network		MDK-Plus	\sim	7.15.0	IPv4 Networking using Ethernet or Serial protocols
🗄 🚸 USB		MDK-Plus	\sim	6.15.0	USB Communication with various device classes
Validation Output		Description	_		
		Description			
Resolve Select Packs Details		ОК	C	ancel	Help

Figure 5 Window Manage Run-Time Environment in Keil uVision

The window **Select Software Packs for Target** opens. As mentioned above, the checkbox to use the latest version of the installed pack is checked per default and the name and version of the used pack are greyed out.



Use latest versions of all installed Soft	ware Packs			
Pack	Selectio	n	Version	Description
ARM::CMSIS	latest	\sim	5.8.0	CMSIS (Common Microcontroller Software Interface Standard)
ARM::CMSIS-Driver	latest	\sim	2.6.1	CMSIS Drivers for external devices
Infineon::TLE984x_DFP	latest	\sim	1.2.0	Infineon TLE984x Series Device Support
Infineon::TLE985x_DFP	latest	\sim	1.1.8	Infineon TLE985x Series Device Support
Infineon::TLE986x_DFP	latest	\sim	1.4.6	Infineon TLE986x Series Device Support
Infineon::TLE987x_DFP	latest	\sim	1.5.0	Infineon TLE987x Series Device Support
Infineon::TLE988x_9x_DFP	latest	\sim	0.2.10	Infineon TLE988x/TLE989x Series Device Support
Keil::ARM_Compiler	latest	\sim	1.6.3	Keil ARM Compiler extensions for ARM Compiler 5 and ARM Compiler 6
Keil::MDK-Middleware	latest	\sim	7.13.0	Middleware for Keil MDK-Professional and MDK-Plus

Figure 6 Window Select Software Packs for Target in Keil uVision

To use a different pack, uncheck the checkbox on the top and select the pack version that you want to work with. Click **OK** to exit.

Pack			
	Selection	Version	Description
ARM::CMSIS	fixed 🗸	5.8.0	CMSIS (Common Microcontroller Software Interface Standard)
ARM::CMSIS-Driver	excluded \sim		CMSIS Drivers for external devices
Infineon::TLE984x_DFP	excluded \sim		Infineon TLE984x Series Device Support
Infineon::TLE985x_DFP	excluded \sim		Infineon TLE985x Series Device Support
Infineon::TLE986x_DFP	excluded \sim		Infineon TLE986x Series Device Support
Infineon::TLE987x_DFP	fixed 🗸	1.4.8	Infineon TLE987x Series Device Support
1.5.0			
····· 1.4.8			
Infineon::TLE988x_9x_DFP	excluded ~		Infineon TLE988x/TLE989x Series Device Support
Keil::ARM_Compiler	excluded \sim		Keil ARM Compiler extensions for ARM Compiler 5 and ARM Compiler 6
Keil::MDK-Middleware	excluded \sim		Middleware for Keil MDK-Professional and MDK-Plus

Figure 7 Use of an older pack in Keil uVision

Check that there is no conflict in the *Manage Run-Time Environment* window, otherwise solve them, before clicking *OK*.



1.5 How to update a project with a new pack version

When you open a project created with an older pack, there may be files which have been updated in the newer pack. Keil informs you about these files with a small icon next to their names.

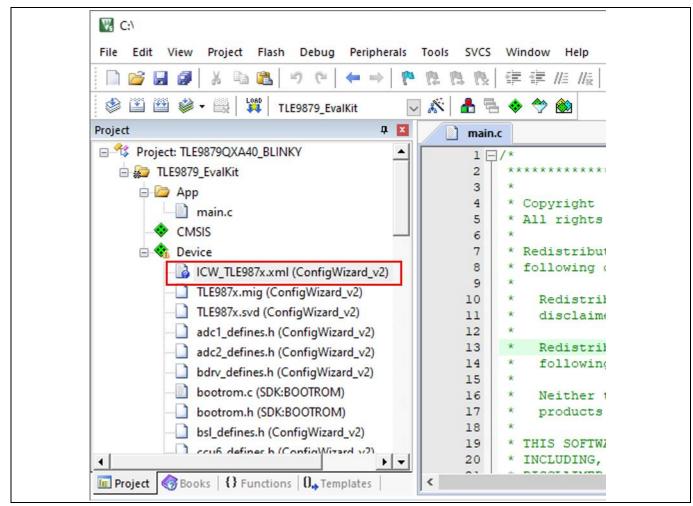


Figure 8 Example of file to update in Keil uVision

You can encounter the following icons:

- for a sub minor version update, e.g. v1.2.3 to v1.2.4
- for a minor version update, e.g. v1.2.3 to v1.3.0
- for a major version update, e.g. v1.2.3 to v2.0.0

You may want to update the concerned files so that your project is running with the newer pack. To do, rightclick on the files to display the options and select *Update Config File...*.

Unfortunately, there is no way to update all modified files at once.

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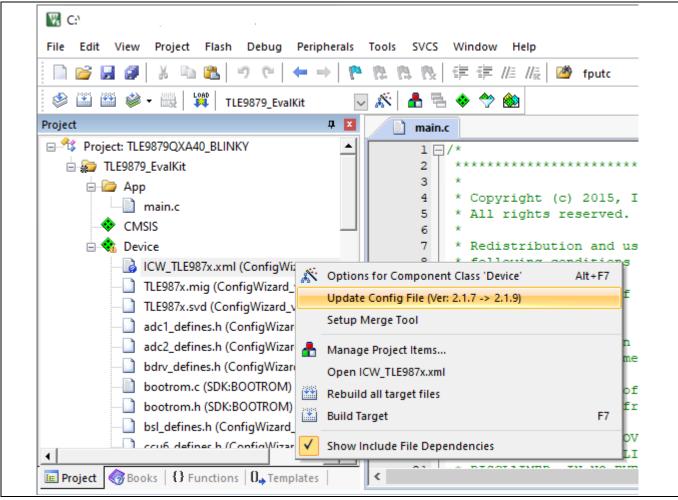


Figure 9 Update Config File in Keil uVision

fineon



1.6 How to show variables/registers/memory in the debugger

Sometimes a variable is not shown in the debugger. This is because **local** variables don't have a fix address in RAM, they are placed in the stack or in registers. On the contrary, **static** or **global** variables have a reserved space in RAM and can be shown in the debugger.

<u>uint8</u> u8_globalVar;
void function (void)
<pre>static uint8 u8_staticVar = 0; uint8 u8_localVar;</pre>
/* code */ }

Figure 10 Function with different variables

In the example code, the two variables u8_globalVar and u8_staticVar can be seen in the debugger, while u8_localVar can only be watched when the function is being executed. By adding static to the local variable, it can be made static and also be seen in the debugger.

You can see the variable then by right-clicking it and selecting Add *variable_name* to... → Watch 1 or Watch 2. The Watch windows can also be opened from the menu View, by selecting Watch Windows and then Watch 1 or Watch 2.

In Keil uVision, the **System Viewer Windows** offers access to the registers of the device, and also to single fields of the registers.

<pre>MOVS r0,r0 MOVS r0,r0 Core Peripherals MOVS r0,r0 ADC ADC ADC ADC ADC1 ADC2 ADC1 ADC1 ADC2 ADC1 ADC1 ADC1 ADC1 ADC1 ADC1 ADC1 ADC1</pre>			
MOVS r0,r0 ; 'imer13 */ BL.W 0x110 Tmr_T13(); NOP NOP MOP tart(): e987x.S LIN MF .e_device.h" ral_board.h" .ization of harc ; 'imer13 */ TIMER MC ADC ADC1 ADC2 ADC2 ADC2 CCU6 CPU DMA MF PMU PORT SCU SCUPM on Config Wiza	- 🖾 - 🔭 - 🔝 -	🚾 • 🕅 📉 •	
<pre>; ADC ADC1 ADC1 ADC1 ADC1 ADC1 ADC1 ADC1 ADC1</pre>		Core Peripherals	+
; ADC ADC1 ADC1 ADC1 ADC1 ADC1 ADC1 ADC1 ADC1 ADC1 ADC1 ADC2 ADC2 ADC1 ADC2 A	MOVS r0, r0		
BL.W 0x110 Tmr_T13(); CPU NOP NOP DMA Hart(): e987x.S LIN e987x.S LIN MF e_device.h" ral_board.h" PORT .d) SCU SCUPM .ization of harc ; limer13 */ TIMER DMA on Config Wiza	;	ADC	ADC1
<pre>STmr_T13(); NOP NOP Start(): e987x.S UN e987x.S UN MF .e_device.h" val_board.h" PORT .d) SCUPM SCUPM .ization of hard ; 'imer13 */ TIMER CPU DMA MF PMU PORT SCU SCUPM () SCUPM SCUP SCUPM SCUPM SCUPM SCUPM SCUPM SCUP SCUPM SCUPM SCUP SCUPM SCUP SCUP SCUP SCUP SCUP SCUP SCUP SCUP</pre>			ADC2
NOP DMA itart (). GPT12E e987x.S UIN e987x.S MF .e_device.h" PMU ral_board.h" PORT .d) SCU .ization of hard SSC ; TIMER		CCU6	
NOP DMA GPT12E e987x.S LIN MF .e_device.h" val_board.h" PORT .d) SCUPM .ization of hard ; 'imer13 */ TIMER DMA on Config Wiza	:Tmr_T13();	CPU	
<pre>chart(). GPT12E e987x.S LIN MF .e_device.h" PMU ral_board.h" PORT .d) .ization of hard ; limer13 */ TIMER on Config Wize</pre>	NOP		
GPT12E e987x.S LIN MF .e_device.h" ral_board.h" .d) .ization of hard ; :imer13 */ TIMER GPT12E UN MF PORT on Config Wize		DMA	
MF .e_device.h" PMU ral_board.h" PORT .d) SCU .ization of harc ; 'imer13 */ TIMER • on Config Wiza		GPT12E	
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.d) scup .ization of hard ; :imer13 */ TIMER • on Config Wiza			
SCUPM .ization of hard ; :imer13 */ TIMER On Config Wiza		PORT	
SCUPM .ization of hard ; :imerl3 */ TIMER on Config Wiza on Config Wiza	.d)	SCU	
imer13 */ TIMER		SCUPM	
imer13 */ TIMER ►	ization of har	ssc	on Config Wiza
(); UART			
	; <u>imr_113(</u>);	UART	•

Figure 11Register view in Keil uVision



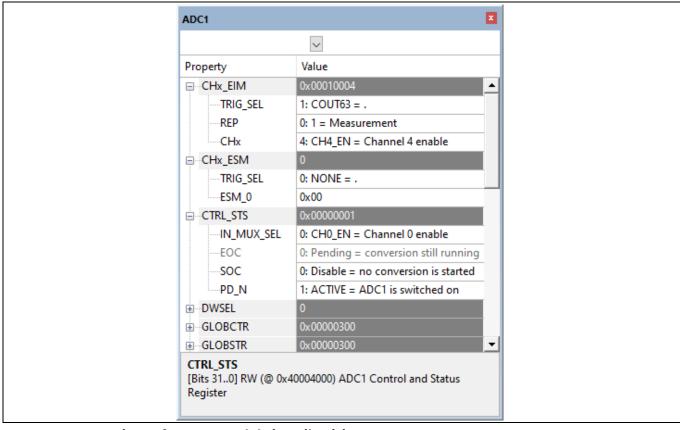


Figure 12 Registers for ADC1 module in Keil uVision

The values in the Watch and Register windows can be updated periodically by selecting the option **Periodic Window Update** in the menu **View** (when checked, the values are updated automatically).

In Keil uVision, the memory viewer can be opened by selecting **View**, then **Memory Windows** and **Memory 1/2/3/4**. In the Memory window, the memory can be watched, specified by an address (entered as hexadecimal, with the prefix 0x).



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1.7 How to check for a stack over-/underflow

In case a global variable is changed without apparent reason, the root cause might be a stack overflow. This happens when the stack size is too low. In our Keil uVision examples, the stack size can be defined in the startup file.

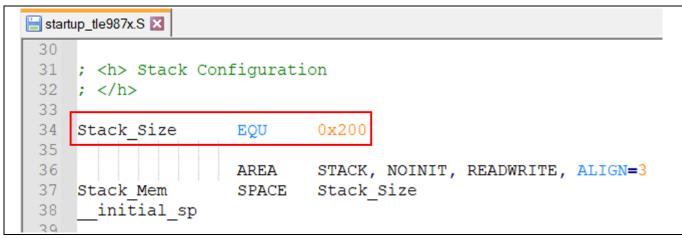


Figure 13 Stack size definition in the startup file

The map file indicates where the stack begins (lowest address of the stack), as highlighted in the following figure. It can be opened after compilation by double-clicking on the **Target** in the Project explorer, or alternatively by navigating to it in the File explorer. It is located in the **Listings** folder of the project.

ADC1_POTI_EIM.map				
i.main	0x11000f4c	Section	0	<pre>main.o(i.main)</pre>
.constdata	0x11000f78	Section	92	bootrom.o(.constdata)
.ARMat_0x1101EFFC	0x1101effc	Section	4	<pre>system_tle987x.o(.ARMat_0x1101EFFC)</pre>
tagsym\$\$used	0x1101effc	Number	0	<pre>system_tle987x.o(.ARMat_0x1101EFFC)</pre>
.data	0x18000018	Section	5	wdt1.o(.data)
bSOWactive	0x1800001c	Data	1	wdt1.o(.data)
STACK	0x18000020	Section	512	<pre>startup_tle987x.o(STACK)</pre>

Figure 14 Stack begin indicated in the map file

In this case, the stack is from 0x18000020 to 0x1800021F. If the stack pointer is not in this range, a stack under-or overflow has occurred.

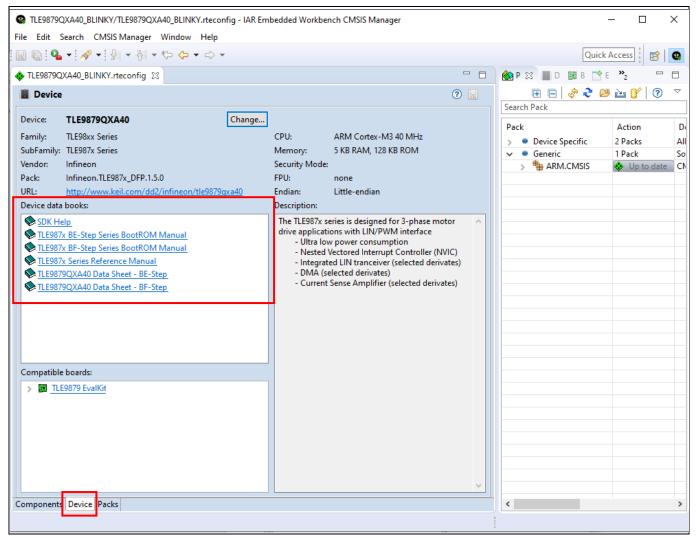
In case there is a stack overflow, the stack pointer doesn't point to an address within the stack range.



2 IAR Embedded Workbench Topics

2.1 SDK help and general documentation

You can access the SDK help and the general documentation in the section *Device data books* of the tab *Device* in the .rteconfig file of your project.







2.2 How to use a fixed pack version

Per default, a project runs with the latest installed pack of the used chip. You still have the possibility to use an older fixed pack.

In the CMSIS Manager, open the *.rteconfig* file of your project and select the tab *Packs*. In the window, you can see the packs that are installed on your computer for the device that you are using.

In the figure below, there are two packs installed for the device MOTIX[™] TLE9879QXA40: v1.5.1 and v1.5.0.

- The checkbox **Use all latest Packs** is checked by default, so that the pack v1.5.1 is used for your current project.
- The icon in front of the used pack version is yellow
- The label right to the pack name in the Selection column is "latest"
- The cell right to the used pack version in the Selection column is green and checked.

TLE9879QXA40_BLI	NKY/TLE9879QXA	40_BLINKY.	rteconfig - IAR Embedded Workbench CMSIS Manager				1		×
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TLE9879QXA40_BLIN	KY.rteconfig 😫			 😢 Packs 🔳 Devices 💷 Boards 📑 Examples	s 🛿 🗖 Cor	isole 🤨 Error Log		1	- 0
Packs 🗹 Use all la	atest Packs 🚸 Ins	tall Missing	Packs Show only used Packs	E	Only show	examples from installed packs	÷ 2 😕	🗠 🕜 🛛 🔿	ð
Pack	Selection	Version	Description	Search Example					
	latest	5.7.0	CMSIS (Cortex Microcontroller Software Interface Standard)	Example	Action	Description			
Infineon.TLE987>	DF latest	1.5.1	Infineon TLE987x Series Device Support	TLE9879QXA40_BLDC_FOC_SENSORLESS	Import	Driving a BLDC motor with ser	nsorless FOC		
# 1.5.1	Image: A start and a start	1		TLE9879QXA40_BLDC_FOC_SENSORLESS_	Import	Driving a BLDC motor with ser	nsorless FOC	controlle	do
₱ 1.5.0				TLE9879QXA40_BLDC_HALL (TLE9879 Eva	Import	Driving a BLDC motor with blo	ock commuta	tion with	HA
		1		TLE9879QXA40_BLDC_HALL2 (TLE9879 E	Import	Measuring the Hall Pattern of	a BLDC moto	or and driv	ving
				TLE9879QXA40_BLDC_HALL_LIN (TLE9875	Import	Driving a BLDC motor with blo	ock commuta	tion with	HA
				TLE9879QXA40_BLINKY (TLE9879 EvalKit)	Import	Blinking a LED			
				TLE9879QXA40_BLINKY_RUNNING_LIGHT	Import	Running lights			
				TLE9879QXA40_CCU6_ADC1_SYNC (TLE98	Import	Synchronizing ADC1-EIM with	CCU6 ch0		
				TLE9879QXA40_CCU6_PWM (TLE9879 Eva	Import	Generating PWM via CCU6			
				TLE9879QXA40_CCU6_SIN_PWM (TLE9879	Import	Generating sinusoidal PWM via	a CCU6		
				TLE9879QXA40_DMA_ADC1_SEQ (TLE987	Import	Triggering DMA after complet	ting an ADC1	sequenc	e
				TLE9879QXA40_DMA_SCTGTH (TLE9879 E	Import	Multiple memory copy using [DMA.Ch0 sca	tter-gathe	er n
	_			TLE9879QXA40_DMA_SPI (TLE9879 EvalK	Import	Sending data through SPI usin	g DMA		
Components Device Pa	acks			<					>

Figure 16 Tab Packs in the .rteconfig file in the CMSIS Manager in IAR Embedded Workbench

To use the previous version v1.5.0, uncheck the checkbox *Use all latest Packs* and select the version 1.5.0.

TLE9879QXA40_BLI	NKY/TLE9879QXA	40_BLINKY.	rteconfig - IAR Embedded Workbench CMSIS Manager					1		×
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Packs* 🗆 Use all	latest Packs 🚸 🗈	stall Missin	g Packs 🗹 Show only used Packs 💿 😨	1	E	Only show	examples from installed packs	* 2 13	ès 💕	0
Pack	Selection	Version	Description		Search Example					
> ARM.CMSIS	fixed	5.7.0	CMSIS (Cortex Microcontroller Software Interface Standard)		Example	Action	Description			
hineon.TLE987	DF fixed	1.5.0	Infineon TLE987x Series Device Support		TLE9879QXA40_BLDC_FOC_SENSORLESS	Import	Driving a BLDC motor with ser	sorless FOC		
# 1.5.1		1			TLE9879QXA40_BLDC_FOC_SENSORLESS_	Import	Driving a BLDC motor with ser	sorless FOC	control	ied o
# 1.5.0					TLE9879QXA40_BLDC_HALL (TLE9879 Eva	Import	Driving a BLDC motor with blo	ock commut	ation wi	th HA
2		-			TLE9879QXA40_BLDC_HALL2 (TLE9879 E\	Import	Measuring the Hall Pattern of a			
					TLE9879QXA40_BLDC_HALL_LIN (TLE9879	Import	Driving a BLDC motor with blo	ock commut	ation wi	th H/
					TLE9879QXA40_BLINKY (TLE9879 EvalKit)		Blinking a LED			
					TLE9879QXA40_BLINKY_RUNNING_LIGHT	Import	Running lights			
					TLE9879QXA40_CCU6_ADC1_SYNC (TLE98	Import	Synchronizing ADC1-EIM with	CCU6 ch0		
					TLE9879QXA40_CCU6_PWM (TLE9879 Eva	Import	Generating PWM via CCU6			
					TLE9879QXA40_CCU6_SIN_PWM (TLE987!	Import	Generating sinusoidal PWM via	a CCU6		
					TLE9879QXA40_DMA_ADC1_SEQ (TLE987	Import	Triggering DMA after complet	ing an ADC	1 sequer	ice
					TLE9879QXA40_DMA_SCTGTH (TLE9879 E	Import	Multiple memory copy using D	MA.Ch0 sca	tter-gat	her n
					TLE9879QXA40_DMA_SPI (TLE9879 EvalK	Import	Sending data through SPI using	g DMA		
omponents Device Pa	acks				<					>

Figure 17 Selection of a fixed pack version in IAR Embedded Workbench

PUBLIC FAQ Software MOTIX[™] Embedded Power ICs based on Arm[®] Cortex[®]-M IAR Embedded Workbench Topics



When selecting this fixed version:

- The icon in front of v1.5.0 is now yellow it was grey before
- The label right to the pack name in the Selection column is "fixed"
- The cell right to the used pack version (1.5.0) in the Selection column is white and checked.
- The cell right to the previously used pack version (1.5.1) is yellow

When saving your configuration, the cell right to the version 1.5.0 becomes green. In the *Components* tab, you can see that the fixed pack version 1.5.0 has been considered by hoovering onto the different components of the project.

TLE9879QXA40_BLINKY, File Edit Search CMSIS) - IAI	R Embedd	ed Workbench CMSIS Manager
		-				
TLE9879QXA40_BLINKY.rd	tecon	fig 🛿				- 8
🚸 Components 🗹 Reso	olve					0 🖫
Software Components TLE9879QXA40 Solution CMSIS Solution CMSIS Driver CMSIS Driver Solution CMSIS Driver Sol	Sel.	Variant	Vendor Infineon		Version	Description <u>ARM Cortex-M3 40 MHz</u> , 5 KB RAM, 128 KB I <u>Cortex Microcontroller Software Interface Cc</u> <u>Unified Device Drivers compliant to CMSIS-I</u> <u>Startup, System Setup</u> <u>Select if target device is BF-Stepping</u>
			Infineon		1.8.6	Infineon ConfigWizard Configuration File
ConfigWizard v2			Infineon		2.1.12	Infineon ConfigWizard Configuration File
7 · JDK		ConfigWizard ConfigWizard ConfigWizard Configuration Confi		File		
• Startup	_	neon.rte987x_D	FF. 1.J.U		1.1.0	System Startup for Infineon TLE987x device s
** { more }						Pack filtering is in effect, some components a
<						>
Validation Output				Des	cription	
Components Device Packs						>

Figure 18 Use of a fixed pack version in the tab Components in IAR Embedded Workbench



IAR Embedded Workbench Topics

2.3 How to show variables/registers/memory in the debugger

In IAR Embedded Workbench, you can access the registers of the devices in the Debug mode via the menu **View** and by selecting **Registers**.

File Edit	View	v Project Debug Disa	semb	ly J-Link Tools Window Help
100		Messages	C	- < Q >
Workspace		Workspace	×	main.c main.c x
Debug		Source Browser	~	main()
Files		C-STAT	F	52 ** LED7 will be on
		C-RUN		53 - ****************
⊢⊕ ≡ ap				54 55 #include "tle devi
		Breakpoints		56 #include "eval boa
L-🕀 🛋 OI	[昌	Call Stack		57
		147-1-1-		58 void Diagnostic_St
	_	Watch		59 b 60 int main(void)
	e	Live Watch		
	e	Quick Watch		62 /* Initializatio
		Auto		63 TLE_Init();
		Locals		64
	e	Statics		65 for (;;)
	,			66 - { 67 (void) WDT1 Ser
		Memory		68 Diagnostic Sta
		Registers		Registers 1
TLE9879Q		Disassembly		Registers 2
Debug Log		Stack	5	Registers 3
Log	₩,	Symbolic Memory	57	Registers 4
Mon S	>_	Terminal I/O	品	Register User Groups Setup





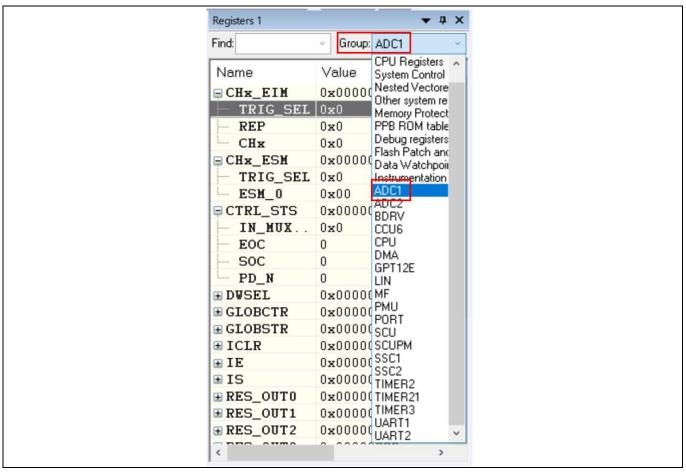


Figure 20 Registers for ADC1 module in IAR Embedded Workbench

In IAR Embedded Workbench, the memory viewer can be opened by selecting **View**, then **Memory Windows** and **Memory 1/2/3/4**. In the Memory window, the memory can be watched, specified by an address (entered as hexadecimal, with the prefix 0x).

Memory 1				
Go to	0x18000000 ~	Memory	~	<u>.</u> .
0x1800				
0x1800		00000000		
0x1800		00000000		
0x1800		00000015		
0x1800		11000c14		
0x1800		fef5eda5		
0x1800		00000000		
0×1800	01360 00000000	0000000		

Figure 21

Memory view in IAR Embedded Workbench



3.1 Why to use Config Wizard for MOTIX[™] MCU

Config Wizard for MOTIX[™] MCU (Embedded Power ICs) is a tool which allows an easy configuration of Automotive MOTIX[™] Embedded Power IC products.

The GUI is designed to be intuitive. It is divided into several tabs, each tab focusing on the configuration of one chip module. The settings are done via combo boxes, checkboxes, edits, radio buttons, spin boxes, In some cases, a graphic overview is provided to summarize the configuration and enhance the understanding of the user.

It is also designed to facilitate the configuration, e.g. by locking elements which are influenced by other elements (see Help within Config Wizard for MOTIX[™] MCU) or by greying out elements that must not be configured in certain cases.

It is available via the Infineon Developer Center.



3.2 Principle of Config Wizard for MOTIX[™] MCU

When saving a configuration in Config Wizard, several files are created/updated:

• config.icwp

This file saves the settings selected in the GUI. By opening the project, the next time in the Config Wizard, the previously configured settings are loaded from the config.icwp file.

• *_defines.h header files

Config Wizard exports several *_defines.h header files, one per module. These header files contain of macro defines only and are further processes by the SDK files.

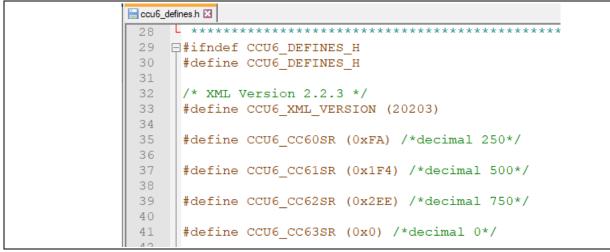


Figure 22 Snippet of ccu6_defines.h

The macro defines are then further used by the according initialization routines, written to the according registers directly to apply the settings from Config Wizard.

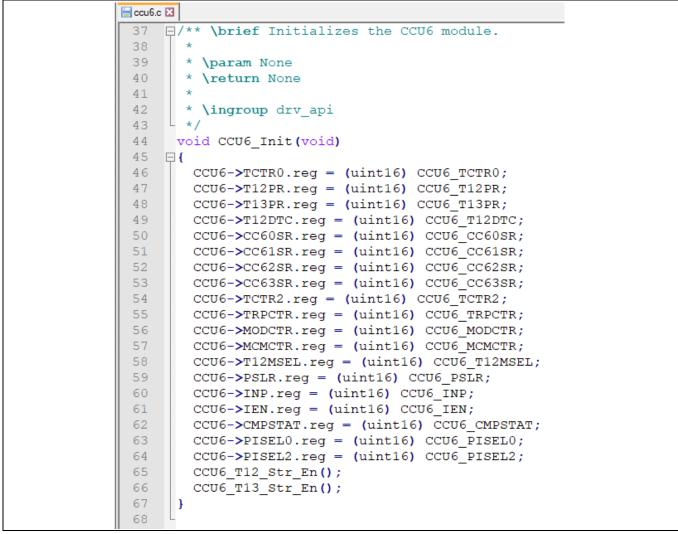


Figure 23 Initialization of the CCU6 modules with the defines from Config Wizard

After this initialization routine, the registers of the device contain the values as configured in Config Wizard.

ineon



3.3 Help within Config Wizard for MOTIX[™] MCU

Locked Element

As mentioned above, the Config Wizard is intended to facilitate the configuration of your device. For this reason, some elements are locking other UI elements to a certain value, meaning that this UI element is disabled for user input and set to the stated value.

For example, selecting the pin P1.2 as input for the Auxiliary Timer 2 of the module GPT12E will automatically lock the direction of the port P1.2 to Input. The yellow tooltip enables you to see the name of the related element.

Infineon Toolbox Config Wiza	rd											
File Extras												
BSL SCU PMU MON Interrupt PORT	ADC1 A	DC2 BDRV	BEMF	CCU6	GPT12E	Timer2x	Timer3	UART	SSC	LIN	CSA	DMA
Structure	Settings											
Mode Select Remote Run Control by T3 Direction Control Timer Value	6MHz											
T2IN Pin Select	T2INA (P1.2)			•								
Interrupt Core Timer3 Aux. Timer4 T3INB/T4IND Input Selector from GPT2		GPT12E PIS Locking: PORT.P1_DI Header: gp Default: lab Enumerated Signal T2IN Signal T2IN Containers:	IR.P2 t12e_de pel=T2IN d Values IB is sele IA is sele	fines.h NA (P1.2 : ected va ected va	2) alue2 1 alue1 0		Pin Sele	ct				

Figure 24 Locking element in the Config Wizard

In the Port tab, you can see that the locked element is now greyed out, which prevents you from changing its value. By hoovering onto the element, the yellow tooltip shows which element is locking the port direction, namely the pin selection in the Auxiliary Timer 2 of the GPT12E module.

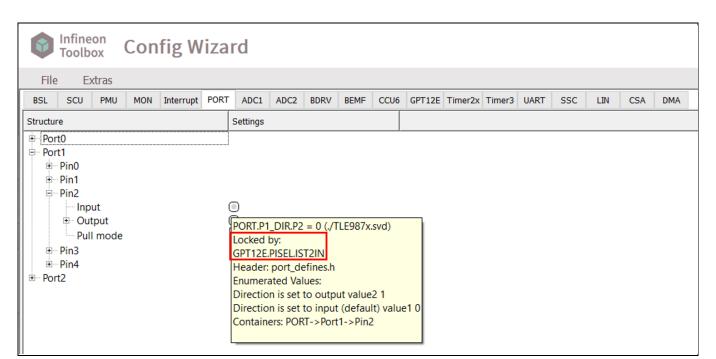


Figure 25 Locked element in the Config Wizard

Conflict due to Locked Elements

It may happen that you select elements which are locking the same UI element but with two different values. In that case, there is a so-called conflict which is notified in the *Log* window in the Config Wizard.

For example, let's select the pin P1.2 for the Auxiliary Timer 2 in the GPT12E module. As seen previously, it will lock the port P1.2 as Input.

In the SSC2 module configured as Slave, let's select P1.2 as Transmitter Output. This is not forbidden by the tool but a warning appears at the bottom.

ineon

PUBLIC **FAQ Software** MOTIX[™] Embedded Power ICs based on Arm[®] Cortex[®]-M

Config Wizard for MOTIX[™] MCU Topics

Infineon Toolbox Co	nfig W	iza	rd												
File Extras															
BSL SCU PMU MO	N Interrupt	PORT	ADC1	ADC2	BDRV	BEMF	CCU6	GPT12E	Timer2x	Timer3	UART	SSC	LIN	CSA	DMA
Structure			Settings												
Configure SSC1 Configure SSC2 SSC2 Clock Max. Baud Rate Bode Select BodRate Generatio Frror Enable Interrupt Dentrupt De	'n		24MHz 12000kBau	ıd											
B- Slave Mode					1										
Transmitter	Output Sele	ct	P1.2 (MR	ST_2_0)			•								
← Receiver Inp ← Clock Input ● Master Mode			none none O	PO Wa PO He	cking: RT.P1_2 liting to RT.P1_D ader: ss)] es.h								
Log Script Command List New configuration: ICW_TLE Warning: PORT.P1 DIR.P2 is v	187% xml. No l raiting to be lo			To up	late co	nfigurat	ion plea		this file:			_			

Warning due a conflict in locking in Config Wizard Figure 26

The conflict comes from the fact that the port P1.2 is locked on two contradictory ways: as input for GPT12E and as output for SSC2.

As long as the conflict is not solved, it is not possible to save the whole configuration of the Config Wizard.





3.4 How to integrate the Config Wizard for MOTIX[™] MCU into Keil uVision

If the Config Wizard notices on startup that a Keil µVision 5 is installed on the system, it asks to integrate itself into the Keil develop environment. A dialog comes up where already installed Config Wizards are shown and where you can decide if you want to integrate the newly installed Config Wizard into Keil. This would mean that it can be started from Keil as an external tool.

📰 Keil	µVision 5 Integration	×
?	Other Config Wizard(s) were integrated into Keil µVision5.	
	Paths: -C:\Infineon\Tools\Config Wizard for Embedded Power ICs\2.6.5.202107021634\ConfigWizard.exe	
	Should the running Config Wizard be also integrated?	
	Hint: Config Wizard can be removed in Keil by menu "Tools Customize Tools Menu"	s ->
	Remember my decision	
	Yes No	

Figure 27 Automatic integration of Config Wizard into Keil uVision

You can also manually add the Config Wizard in the Tools menu of Keil uVision.

Open Keil uVision and select *Tools > Customize Tools Menu*...

File Edit View Proje	ct Flash Debug	Peripherals	Tools	SVCS	Window	Help	
🗋 💕 🔙 🥔 🐰	9 C A A	$ \leftarrow \Rightarrow $	S	et-up PC	-Lint		putc
🔄 🛎 🛍 🧼 - 📖	LOAD TLE9893_20		Lint				
Project	д 🛛		Li	int All C/(C++ Source	Files	
⊕ 🍄 Project: TLE9893_2	QKW62S_BLINKY_S		с	onfigure	Merge Too	l	
			c	ustomize	Tools Men	u	
			IF	XConfig	Wizard		
			St	tart VP (P	ython only	interface)	
			S	tart Debu	ug with VP		
			_				-

Figure 28 Menu Tools > Customize Tools Menu... in Keil uVision



PUBLIC FAQ Software MOTIX[™] Embedded Power ICs based on Arm[®] Cortex[®]-M Config Wizard for MOTIX[™] MCU Topics

The figure below shows the window in which you can integrate the Config Wizard.

Customize Tools Menu X	
Menu Content: X ↑ ↓ IFXConfigWizard Start VP (Python only interface) Start Debug with VP All Entries Import Export	
Prompt for Arguments Run Minimized Run Independent	
Command: C:\Program Files (x86)\Infineon Technologies\IFXConfigWiza	
Arguments: "\$PRTE\Device\\$D\config.icwp" OK Cancel Help	

Figure 29 Window Customize Tools Menu

Click on the Add button . A new empty line appears in the tools list, where you can add a meaningful name for the Config Wizard.

The edits at the bottom must be configured as follows:

- **Command**: The path where your Config Wizard application is stored
- Initial Folder: Not necessary, unless you always want to start the Config Wizard from the same project folder
- Arguments:
 - Older than version 2.6.x: "\$PRTE\Device\\$D\config.icwp"
 - From version 2.6.x: *"\$PRTE\Device\\$D\config.icwp" -ddevice=\$D*

Select *Run Independent* to be able to use the Config Wizard independently from Keil uVision.

Click **OK** to save your new tool. It appears now at the bottom of the Tools menu.



File Edit View F	Project Flash Debu	g Peripherals T	Tools SVCS W	/indow	Help			
🗋 💕 🗟 🧭	X BB 90	$ \leftarrow \rightarrow \not \sim$	Set-up PC-Lin	nt	putc			
ی 😂 🔛 🔮 🔹	🔜 👯 TLE9893_2	QKW62S	Lint					
Project	д 🛛		Lint All C/C+	+ Source F	iles			
🖅 😚 Project: TLE98	93_2QKW62S_BLINKY_	5	Configure Me	erge Tool				
			Customize To	ols Menu.				
			IFXConfigWizard					
			Start VP (Pyth	ion only in	terface)			
			Start Debug	with VP				
			Config Wizar	d v2.6.4				

Figure 30 Config Wizard as new tool in Keil uVision

Note: For Config Wizard versions older than 2.6.x, the argument phrase is incorrect. Please correct it to "\$PRTE\Device\\$D\config.icwp" -ddevice=\$D



How to integrate the Config Wizard for MOTIX[™] MCU into IAR Embedded 3.5 Workbench

To integrate the Config Wizard into IAR Embedded Workbench, open the IDE and select **Tools > Configure Tools...**

😌 0210 - IAR Embedded Workbench	IDE - Arm 8.50.9
File Edit View Project J-Link	Tools Window Help
i 🗅 🗅 🔛 🕋 🖴 X 🗈 Ö	🕈 Options 🛌 🗧 < 🤤 >
	Filename Extensions
	Configure Viewers
	Configure Custom Argument Variables
	🍐 Configure Tools
	IAR Project Converter

Figure 31 Menu Tools > Configure Tools... in IAR Embedded Workbench

The figure below shows the window in which you can integrate the Config Wizard.

Ca	onfigure Tools		
м	Venu Content:	ОК	
		Cancel	
		New	
_ _	vienu Text:	Delete	
c	Command:		
		Browse	
A	årgument:		
In	nitial Directory:		
	Redirect to Output Window Prompt for Command Line		
Т	fool Available:		
A	Always 🗸 🗸		

Window Configure Tools Figure 32



Click on the **New** button. A new empty line appears in the Menu Content. The edits at the bottom must be configured as follows:

- Menu Text: A meaningful name for the Config Wizard to add
 - Command: The path where your Config Wizard application is stored
- Argument:
 - Older than version 2.6.x: "\$PROJ_DIR\$\RTE\Device\\$D\$\config.icwp"
 - From version 2.6.x: "\$PROJ_DIR\$\RTE\Device\\$D\$\config.icwp" -ddevice=\$D\$

Where \$PROJ_DIR\$ refers to your project directory and \$D\$ to the device name

Select Always for *Tool Available* to be able to use the Config Wizard independently from the IAR IDE.

Menu Content: CW 2.6.4	OK
CW 2.0.4	ОК
	Cancel
	New
	Delete
Menu Text:	
CW 2.6.4	
Command:	
C:\Infineon\Tools\Config Wizard for Embedded Power ICs\2.6.4.202103181245\Con	ifigWizard.exe Browse
Argument:	
"\$PR0J_DIR\$\RTE\Device\\$D\$\config.icwp" -ddevice=\$D\$	
Initial Directory:	
Redirect to Output Window	
Prompt for Command Line	

Figure 33 Configuration of Config Wizard as new tool

Click **OK** to save your new tool. It appears now at the bottom of the **Tools** menu.



 Image: Solution of the second system of t

		Filenalite Extensions	
		Configure Viewers	
		Configure Custom Argument Variables	
	<i>k</i>	Configure Tools	
		IAR Project Converter	
		CW 2.6.4	
-			

Figure 34 Config Wizard as new tool in IAR Embedded Workbench

As there is no argument variable defined in the IAR Workbench, you have to define one manually. To do so, select **Tools >Configure Custom Argument Variables...**

30 😒	210 - IAR	Embe	dded Wor	kbench l	DE -	Arm 8.50.9	
File	Edit	View	Project	J-Link	Тоо	s Window Help	
8 🏠	🎦 🔛		۲ 🛓	D D	۰	Options	▶= < 😳 >
						Filename Extensions	
						Configure Viewers	
						Configure Custom Argument Variables	
					10	Configure Tools	
						IAR Project Converter	
						CW 2.6.4	

Figure 35 Menu Tools > Configure Custom Argument Variables... in IAR Embedded Workbench

The figure below shows the window in which you can set up the device variable \$D\$. Select the tab **Global** then **New Group...**



Config Wizard for MOTIX[™] MCU Topics

Workspace Global	Enable Group
	New Group
	Add Variable
	Edit Variable
	Delete
	Import
Expand/Collapse All	
Hide disabled groups	

Figure 36 Window Configure Custom Argument Variables, tab Global

In the popup window, give a name to your group, for example Device. Click **OK** to close the window.

New Group	p	×
Name:	Device	
		OK Cancel

Figure 37 Window New Group

The new group appears then in the window Configure Custom Argument Variables, as shown in the next figure.



Configure Custom Argument Variables Workspace Global	
	Disable Group New Group Add Variable Edit Variable Delete
Expand/Collapse All Hide disabled groups Treat all open projects as modified. (Updated variables will be used for relative paths when saving.)	OK Cancel

Figure 38 New group added in the Configure Custom Argument Variables window

Select *Add Variable...* to add a variable and define its value. Here the name is D as defined in the arguments when adding the Config Wizard as new tool. The value is the device name that you are currently using.

🔳 Edit Va	iriable	×
Name:	D	
Value:	TLE9879QXA40	<u> </u>
		OK Cancel

Figure 39 Window Add Variable

Click **OK** to save this variable, which then appears in the window Configure Custom Argument Variables. Click **OK** to save and close this window.



Configure Custom Argument Variables	×
Workspace Global	
D = TLE9879QXA40	Disable Group
	New Group
	Add Variable
	Edit Variable
	Import
Expand/Collapse All	
Hide disabled groups	
☐ Treat all open projects as modified. (Updated variables will be used for relative paths when saving.)	OK Cancel

Figure 40 New argument variable in the window Configure Custom Argument Variables



3.6 How to use the Config Wizard for MOTIX[™] MCU from the command line

The Config Wizard can be started with several command line options that are enumerated in the following:

ConfigWizard [<Filename.xml|icwp>] [-g] [-q] [-s] [-b<Batchfile>] [-c<Outfile>] [-o<Outfile>] [-?]

Where:

- -g: Generate header files
- -q: Quiet mode (no popup window on errors)
- -s: Save project file, with correct hash, and generate header files
- -x: Terminate program after Keil integration
- -k: Enable Keil uVision integration
- -b<Batchfile>: Run the batch file whose path/name is specified in <Batchfile>
- -c<Outfile>: Set console logging file (for output of console and, if in quiet mode, for message box output)
- -o<Outfile>: Set output logging file (for output of batch file/scripting)
- -?: Help



4 Evalkits and Evalboards Topics

4.1 How to access documentation from Keil uVision

After creating a new project, opening an existing one or importing an example from the Pack Installer, select the tab *Books*.

🗋 💕 🛃 🥔 🐰 🛍 🛍 🖉 🔶 🔶	▶ 隆 🎘 🥂 🐺 🚎 /////////////////////////////////
🧇 🔛 🕮 🧼 🕶 🔛 🔤 TLE9879_EvalKit	
Books 🛛 🗸 🔀	main.c
🗄 🎁 Tools User's Guide	1 🖓 / *
🖻 🎁 Device Data Books	2 *********************************
TLE987x Series Reference Manual	3 *
- 💊 TLE987x BE-Step Series BootROM Manual	4 * Copyright (c) 2015, Infineon 1
TLE987x BF-Step Series BootROM Manual	5 * All rights reserved.
TLE9879QXA40 Data Sheet - BE-Step	6 *
TLE9879QXA40 Data Sheet - BF-Step	7 * Redistribution and use in sour
	8 * following conditions are met:
SDK Help	9 *
⊟ Board Data Books	10 * Redistributions of source co
Getting Started (TLE9879 EvalKit)	11 * disclaimer.
Schematics (TLE9879 EvalKit)	12 * 13 * Redistributions in binary fo
	13 * Redistributions in binary for 14 * following disclaimer in the
	15 *
	16 * Neither the name of the copy
	17 * products derived from this s
	19 * THIS SOFTWARE IS PROVIDED BY 1
	20 * INCLUDING, BUT NOT LIMITED TO,
	21 * DISCLAIMED. IN NO EVENT SHALL
	22 * SPECIAL, EXEMPLARY, OR CONSEQU
	23 * SERVICES; LOSS OF USE, DATA, C
< >	24 * WHETHER IN CONTRACT, STRICT LI

Figure 41 Main window in Keil uVision, tab Books

In the section **Board Data Books**, you have an overview of the documentation available for the evalboards or evalkits that you can use with your project. The type of board referred to by the documentation is indicated in parenthesis.



Evalkits and Evalboards Topics

4.2 How to access documentation from IAR Embedded Workbench

After creating a new project, opening an existing one or importing an example from the CMSIS Manager, open the .rteconfig file of your project and select the tab **Device**.

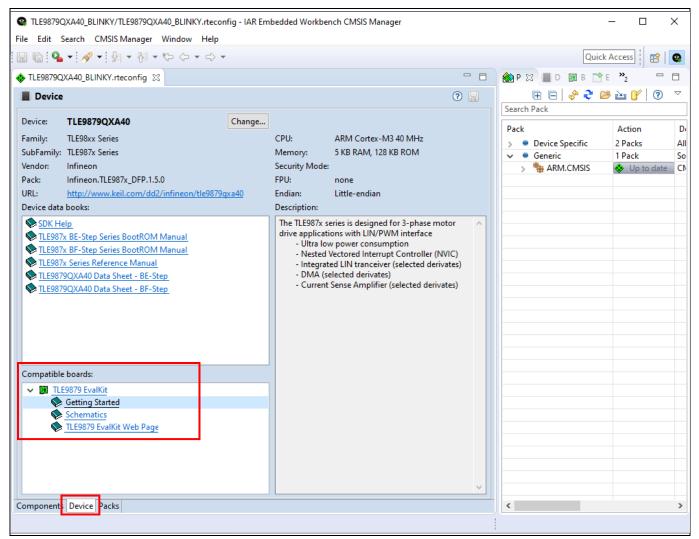


Figure 42 CMSIS Manager for IAR Embedded Workbench, tab Device

In the section *Compatible boards*, you have an overview of the evalboards or evalkits that you can use with your project, as well as documentation for these boards: Getting started, Schematics, ...



5 Software Topics

5.1 How to get the address of the instruction that triggered a Hard Fault

When there is a hard fault, it is often important to know which instruction caused the fault. This can be done as follows:

1. Modify the **HardFault_Handler** in the startup file as follows:

124	HardFault_Handler\		
125	PROC		
126	; EXPORT	HardFault_Handler	[WEAK]
127	;B	. –	
128	BX LR		
129	ENDP		

Figure 43 Modified HardFault_Hander

The BX LR instruction jumps back to the instruction that caused the hard fault.

2. Set a breakpoint at the BX LR instruction and execute the code

When the HardFault Hander is executed, the **Stack Pointer** (marked in green) shows the location of the stack frame (marked in red).

In the 'Memory 1' window in Keil uVision the preferred setting here is 'Unsigned > Long' (appears by right-clicking in the Memory window).



Software Topics

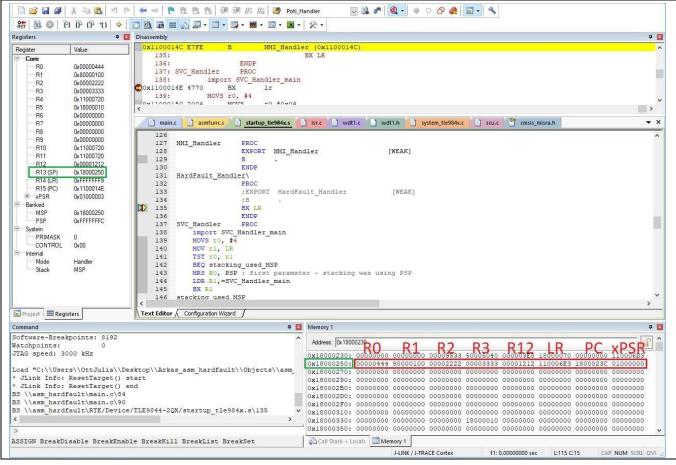


Figure 44 Stack pointer in register view and stack frame in memory view

3. Click into the **Disassembly** window and perform a single step. This leads to the instruction that caused the hard fault (marked in red). It is the same as in the Stack frame above (PC).

Without clicking into the Disassembly window (step in C code), this instruction might not be shown.

In this test, the instruction is in RAM at address 0x1800023C.



Software Topics

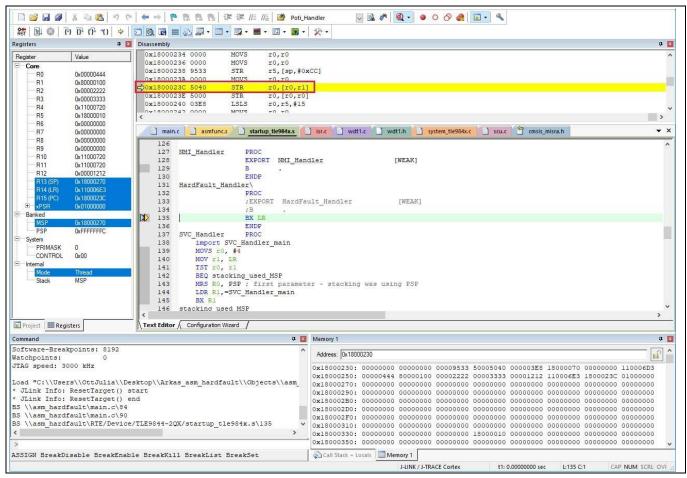


Figure 45 Instruction that caused the hard fault

Another step in the Disassembly leads back to the HardFault Hander, because the faulty instruction has been executed again.



5.2 How to flash the device if it is stuck in sleep mode

If the device enters sleep mode repeatedly after wake-up or the wake-up source is not activated, it is not possible to flash the device which means it is in an unusable state. There are two ways to erase the chip in order to upload an updated software: via TMS pin and via BSL tool.

1) Erase Chip via TMS Pin

- 3. Turn OFF the power supply
- 4. Short the TMS Pin and the VDDP Pin
- 5. Turn ON the power supply
- 6. Remove the short between TMS Pin and VDDP Pin
- 7. Flash the updated code

2) Erase Chip via BSL Tool

The uIO-Stick, together with the BSL Tool, acts as an interface between the MOTIX[™] Embedded Power ICs and a PC. The uIO-Stick uses the build-in boot strap loader (BSL) of the embedded power chips in order to erase and flash the devices. The functions of the uIO-Stick are controlled by a GUI. The following hardware and software is available for MOTIX[™] TLE984x, -5x, -6x and -7x Embedded Power ICs.

The uIO-Stick can be found here: <u>https://www.ehitex.de/en/usb-application-sticks/infineon/2529/uio-stick</u> The uIO Software GUI can be found here: <u>https://www.hitex.com/uio-downloads/</u>

By executing the following steps, the chip can be erased via BSL Tool:

- 1. Turn OFF the power supply of the chip
- 2. Connect the uIO-Stick to the Chip/Eval Board
- 3. Execute UpdateBSL.cmd (calls uIO-Updater.exe with the required firmware as parameter)
- 4. Execute BSL_Tool.exe
- 5. Select *Extra* \rightarrow *Expert mode* (Screenshot is displayed in Figure 46)
- 6. Select Target Device in Configuration \rightarrow Change
- 7. Connect the Device in GUI. Green connected appears in bottom right corner if successful
- 8. Select *Erase* (Full Chip). Check for success in the Logging window (See Figure 46)
- 9. Disconnect the Device in GUI
- 10. Disconnect the uIO-Stick from chip/Eval Board
- 11. Turn ON the power supply of chip
- 12. Flash the updated software, e.g. via debugger



Table of contents

IFX ePower BootStrapLoader - Expert Mode	X
e Extra Help	
Deration Auto Execute	Configuration TLE9844-2QX Change Load Save Logging Save as Clear
Erase Download Verify Protection Run Erase Full Chip Rangefrom 0x11000000 auto execute Used Sections to 0x1100 EFFF Download Verify Download Verify auto execute auto execute Protection BSL 0x1122AA55 R/W v disable v Execute Code 0x1122AA55 R/W v disable v Execute Execute Data 0x1122AA55 R/W v disable v Execute 	BSL starting bootloader ^ CONNECT connect and get BSL option data user ERASE - started BSL erase full chip BSL erase full chip user ERASE - success
auto execute	
ast-LIN only 115200	connected

Figure 46 BSL_Tool Expert Mode



5.3 Troubleshooting: Settings from Config Wizard for MOTIX[™] MCU not applied in the source code

When a peripheral of the MOTIX[™] TLE98xy device is the configured in Config Wizard for MOTIX[™] MCU, but the settings are not visible in the registers, this can have several root causes: Config Wizard settings were not saved or Module not selected in the Run-Time Environment of the IDE.

1) Config Wizard settings were not saved

One possible root cause is that the Config Wizard settings were not saved, and therefore no header file export took place.

The Config Wizard shows this state in the log view at the bottom.

S Config Wizard for MOTIX MCU C:\Users\Ottlulia\Desktop\temp\0315\ADC1_POTI_EIM_EXAMPLE_TLE987X\RTE\Device\TLE9879QXA40\config.icwp -	×
Infineon Developer Center Config Wizard for MOTIX TM MCU	?
File Extras	
BSL SCU PMU MON Interrupt PORT ADC1 ADC2 BDRV BEMF CCU6 GPT12E Timer2x Timer3 UART SSC LIN CSA DMA	1
Structure Settings	
Timer12/13 Configuration	
Timer12 Clock 40MHz	
- Max. Period 1638.38us ⊕ Clock Prescaler	
Period Value Deration Mode Edge-aligned	
Operation Mode Edge-aligned Single Shot disabled	
Trigger External Run Select disabled	
Dead Time Control	
E Timer13 ⊡ Channel Configuration	
 HALL Configuration Interrupt Configuration 	
🗄-Multi-Channel Configuration	
🕀 Trap Control	
	Β×
Log Script Command List	
Loaded configuration: config.icvp. No headerfiles written. To update configuration please save this file!	

Figure 47 Config Wizard before saving and exporting the header files

There are several ways to export the header files:

- File → Save: this option saves the icwp file and generates the header files
- Click Ctrl + S: Same as File → Save
- File → Generate header files: this option generates the header files, but does not save the icwp file. As the icwp will be loaded at the next start of Config Wizard, it is not recommended to use this option

The saving of the icwp file and the header files also generates an info in the log view.



Table of contents

Config Wizard for MOTIX MCU C:\Users\OttJulia\De	sktop\temp\0315\ADC1_POTI_EIM_EXAMPLE_TLE987X\RTE\Device\TLE9879QXA40\config.icwp -	×
Developer Center Config	Wizard for MOTIX [™] MCU	?
File Extras		
BSL SCU PMU MON Interrupt PORT ADC1	ADC2 BDRV BEMF CCU6 GPT12E Timer2x Timer3 UART SSC LIN CSA DMA	
tructure	Settings	
 Timer12/13 Configuration □ Timer12 □ Timer12 Clock □ Max. Period ⊕ Clock Prescaler ⊕ Clock Prescaler 	40MHz 1638.38us	
· · · Operation Mode	Edge-aligned	
···· Single Shot	disabled disabled	
Trap Control	-	-
Log Script Command List		8×
Exported headerfile: C:/Users/OttJula/Deaktop/temp/031 Exported headerfile: C:/Users/OttJula/Deaktop/temp/031	5/ADC1_POTT_EIM_EXAMPLE_TLE987X/RTE/Device/TLE9879QX.440/lin_defines.h 5/ADC1_POTT_EIM_EXAMPLE_TLE987X/RTE/Device/TLE9879QX.440/lin_defines.h 5/ADC1_POTT_EIM_EXAMPLE_TLE987X/RTE/Device/TLE9879QX.440/port_defines.h 5/ADC1_POTT_EIM_EXAMPLE_TLE987X/RTE/Device/TLE9879QX.440/port_defines.h 5/ADC1_POTT_EIM_EXAMPLE_TLE987X/RTE/Device/TLE9879QX.440/port_defines.h 5/ADC1_POTT_EIM_EXAMPLE_TLE987X/RTE/Device/TLE9879QX.440/joc_defines.h 5/ADC1_POTT_EIM_EXAMPLE_TLE987X/RTE/Device/TLE9879QX.440/joc_defines.h 5/ADC1_POTT_EIM_EXAMPLE_TLE987X/RTE/Device/TLE9879QX.440/jimerZX_defines.h 5/ADC1_POTT_EIM_EXAMPLE_TLE987X/RTE/Device/TLE9879QX.440/jimerZX_defines.h 5/ADC1_POTT_EIM_EXAMPLE_TLE987X/RTE/Device/TLE9879QX.440/jimerZX_defines.h 5/ADC1_POTT_EIM_EXAMPLE_TLE987X/RTE/Device/TLE9879QX.440/jimerZX_defines.h 5/ADC1_POTT_EIM_EXAMPLE_TLE987X/RTE/Device/TLE9879QX.440/jimerZX_defines.h 5/ADC1_POTT_EIM_EXAMPLE_TLE987X/RTE/Device/TLE9879QX.440/jimerZX_defines.h 5/ADC1_POTT_EIM_EXAMPLE_TLE987X/RTE/Device/TLE9879QX.440/jimerZX_defines.h 5/ADC1_POTT_EIM_EXAMPLE_TLE987X/RTE/Device/TLE9879QX.440/jimerZX_defines.h	* •
Config Wizard for MOTIX MCU - Version 2.7.0.2	02112171008 C:\Users\OttJulia\Desktop\temp\0315\ADC1_POTI_EIM_EXAMPLE_TLE987X\RTE\Device\TLE9879	

Figure 48 Config Wizard after saving and exporting the header files

2) Module not selected in the Run-Time Environment of the IDE

The other possible root cause is in the Run-Time Environment (RTE) of the IDE. In the Infineon.TLE98*_DFP.pack file, each module consists of a Config Wizard part and an LLD part. The Config Wizard part is always present, the LLD part has to be enabled explicitly to be part of the project. This can be found in the RTE of the IDE (Keil uVision or if supported IAR Embedded Workbench for Arm) at Device \rightarrow SDK \rightarrow *module.*

In order to fix the described root cause:

- 1. Open the RTE in your IDE
- 2. Tick the checkbox for the module you would like to include
- 3. The necessary defines and function calls are automatically added by the IDE

Only when a module is enabled, the init routine of the module is called in the function TLE_init(). This is described in the following figures.



Table of contents

vare Component	Sel.	Variant	Version	Description		
Device				Startup, System Setup	•	
BF-Stepping			0.0.1	Select if target device is BF-Stepping	_	
ConfigWizard			1.8.6	Infineon ConfigWizard Configuration File		
ConfigWizard_v2	v		2.1.12	Infineon ConfigWizard Configuration File		
Startup	v		1.2.0	System Startup for Infineon TLE987x device series		
∋-� SDK						
ADC1	V		0.2.9	Analog Digital Converter 1 (ADC1) driver for TLE987x		
ADC2	V		0.2.6	Analog Digital Converter 2 (ADC2) driver for TLE987x		
BDRV	V		0.5.1	Bridge Driver (BDRV) driver for TLE987x		
BOOTROM	V		0.3.2	BootROM driver for TLE987x		
CCU6	V		0.3.3	Capture Compare Unit (CCU6) driver for TLE987x		
CSA			0.1.8	Current Sense Amplifier (CSA) driver for TLE987x		
DMA			0.2.2	DMA driver for TLE987x		
GPT12E			0.2.1	General Purpose Timer 12E (GPT12E) driver for TLE987x		
INT	v		0.2.3	Interrupt (INT) driver for TLE987x		
ISR ISR	v		0.3.0	Interrupt Service Routines (ISR) driver for TLE987x		
🖉 LIN	v		0.2.0	LIN Tranceiver (LIN) driver for TLE987x		
MON			0.1.7	High Voltage Monitor Input (MON) driver for TLE987x		
PMU	v		0.2.2	Power Management Unit (SCU) driver for TLE987x		
PORT	~		0.5.9	GPIO Ports (PORT) driver for TLE987x		
SCU	•		0.5.6	System Control Unit (SCU) driver for TLE987x		
SSC 📀			0.1.8	High Speed Synchronous Serial Interface 1 and 2 (SSC) driver for T	1	
TIMER2x			0.2.2	Timer2 and Timer21 (TIMER2x) driver for TLE987x	-	
ation Output		Description	<u>ו</u>			
		beenpaor				

Figure 49 Module MON is not enabled in the RTE

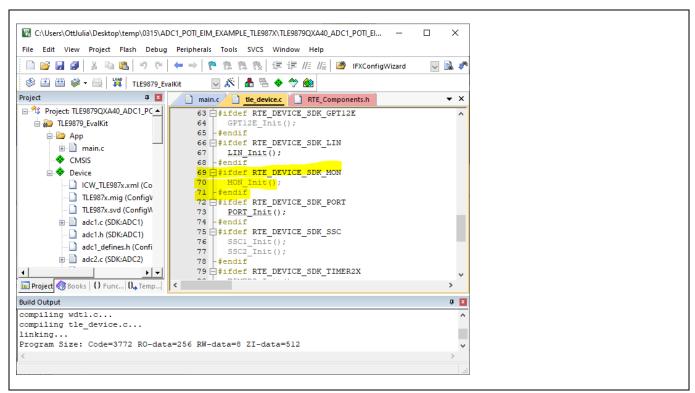


Figure 50 RTE_DEVICE_SDK_MON not defined because the module is not enabled in RTE → MON_Init not called



Table of contents

oftware Component	Sel.	Variant	Version	Description	
💠 Device				Startup, System Setup	
BF-Stepping			0.0.1	Select if target device is BF-Stepping	
ConfigWizard			1.8.6	Infineon ConfigWizard Configuration File	_
ConfigWizard_v2	V		2.1.12	Infineon ConfigWizard Configuration File	
Startup	~		1.2.0	System Startup for Infineon TLE987x device series	
🖻 🚸 SDK					
ADC1	~		0.2.9	Analog Digital Converter 1 (ADC1) driver for TLE987x	
ADC2	V		0.2.6	Analog Digital Converter 2 (ADC2) driver for TLE987x	
BDRV	~		0.5.1	Bridge Driver (BDRV) driver for TLE987x	
BOOTROM	~		0.3.2	BootROM driver for TLE987x	
	~		0.3.3	Capture Compare Unit (CCU6) driver for TLE987x	
CSA			0.1.8	Current Sense Amplifier (CSA) driver for TLE987x	
DMA			0.2.2	DMA driver for TLE987x	
GPT12E			0.2.1	General Purpose Timer 12E (GPT12E) driver for TLE987x	
INT	V		0.2.3	Interrupt (INT) driver for TLE987x	
ISR 🖉	V		0.3.0	Interrupt Service Routines (ISR) driver for TLE987x	
🧼 🖉 LIN	~		0.2.0	LIN Tranceiver (LIN) driver for TLE987x	
MON	V		0.1.7	High Voltage Monitor Input (MON) driver for TLE987x	
PMU	~		0.2.2	Power Management Unit (SCU) driver for TLE987x	
PORT	~		0.5.9	GPIO Ports (PORT) driver for TLE987x	
SCU	~		0.5.6	System Control Unit (SCU) driver for TLE987x	
SSC 📀			0.1.8	High Speed Synchronous Serial Interface 1 and 2 (SSC) driver for T	I I
TIMER2x			0.2.2	Timer2 and Timer21 (TIMER2x) driver for TLE987x	_
				<u> </u>	
lidation Output		Descriptio	'n		
Resolve Select Packs Deta	1-	0	Can	el Help	
Jeied Facks Dela	115				_

Figure 51 Enable MON module in RTE and click 'OK'

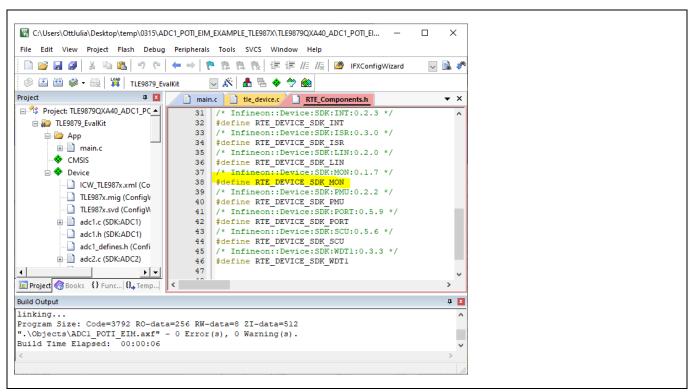


Figure 52 RTE_DEVICE_SDK_MON defined in RTE_Components.h



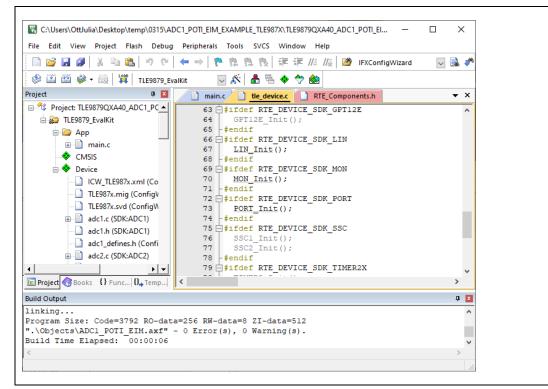


Figure 53 Calling of a module init function in TLE_init() is executed because RTE_DEVICE_SDK_MON is defined

It can be seen in Figure 49 to Figure 53 that after a module is enabled in the RTE, the module init function is called in the TLE_init function.



Revision history

Document version	Date of release	Description of changes
V 1.0	2021-10-01	Initial version
V1.1	2022-08-22	Added chapters 5.2: How to flash the device if it is stuck in sleep mode 5.3: Troubleshooting: Settings from Config Wizard for MOTIX [™] MCU not applied in source code

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