Application Note, V2.0, October 2008

AP32133

MIRIDA

TC1766

TC1766 Starter Kit: "Cookery Book" for a hello world application using Altium's TASKING TriCore toolset

Microcontrollers



Never stop thinking

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AP32110		
Revision History:	2008-10	V2.0
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Page	Subjects (major changes since last revision)	

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mcdocu.comments@infineon.com



Table of Contents

Note: Table of Contents see page 10.

Introduction:

This "Application Note" / "Appnote" is a Hands-On Training / Cookery Book / step-by-step book. It will help inexperienced users to get the TC1766 / TC176x / TC116x Family Starter Kit up and running.

With this step-by-step book you should be able to get your first useful program in less than 2 hours.

The purpose of this document is to gain know-how of the microcontroller and the tool-chain. Additionally, the "hello world example" can easily be expanded to suit your needs. You can connect either a part of - or your entire application to the TC1766 Starter Kit. You are also able to benchmark any of your algorithms to find out if the selected microcontroller fulfils all the required functions within the time frame needed.

Note:

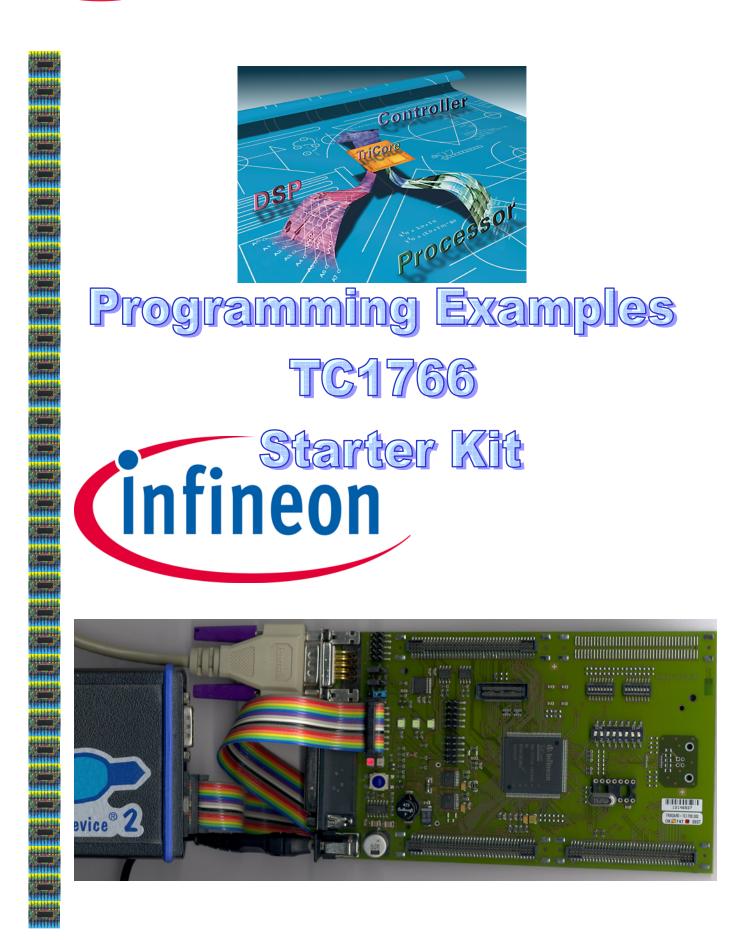
The style used in this document focuses on <u>working through</u> this material as fast and easily as possible. That means there are full screenshots instead of dialog-window-screenshots; extensive use of colours and page breaks; and listed source-code is not formatted to ease copy & paste.

Have fun and enjoy TriCore!



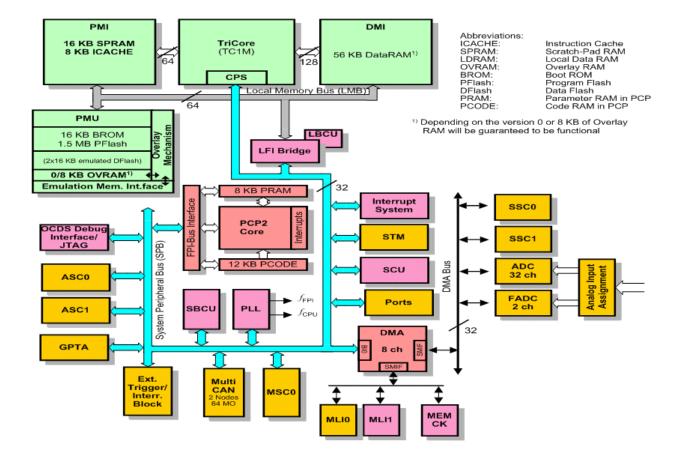
Page





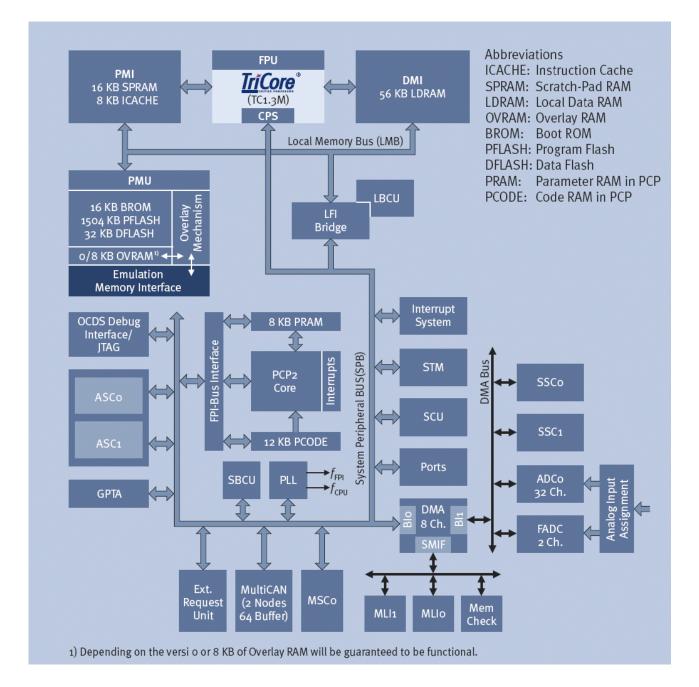


TC1766 Block Diagram (Source: Product Marketing)



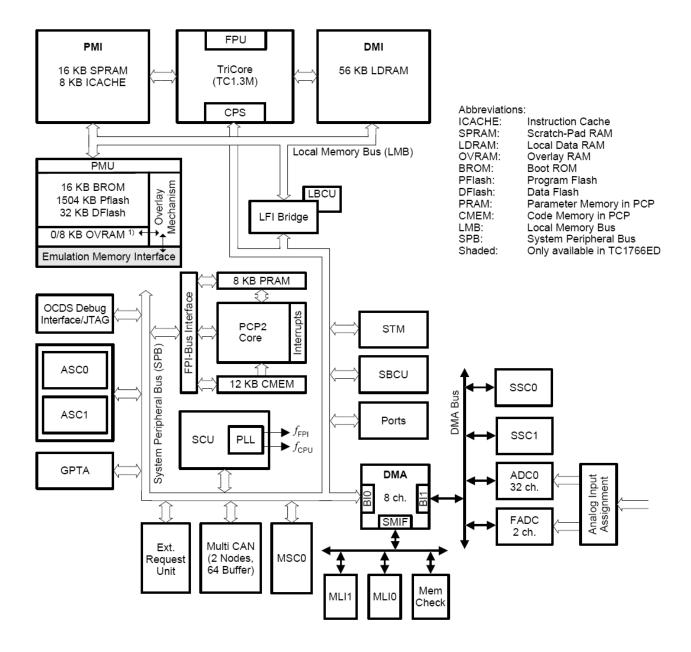


TC1766 Block Diagram (Source: Product Sheet)



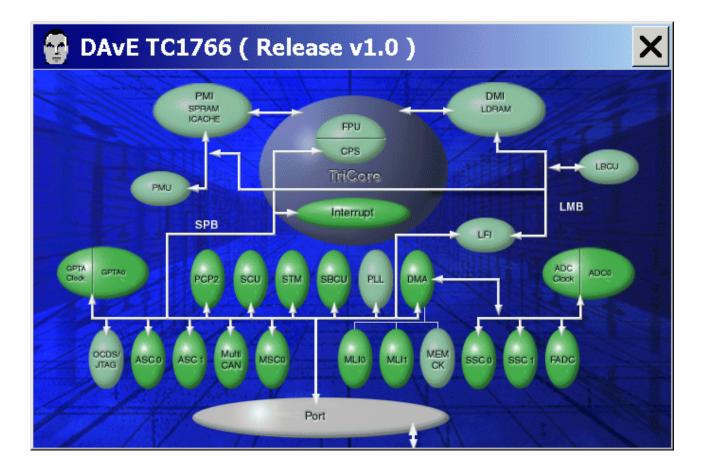


TC1766 Block Diagram (Source: User's Manual)





TC1766 Block Diagram (Source: DAvE)





Note:

Just by comparing the different sources of block diagrams, you should be able to get a complete picture of the TC1766 microcontroller and to answer some of your initial questions.



"Cookery Book"

For your first programming example for the TC1766 Starter Kit Board:

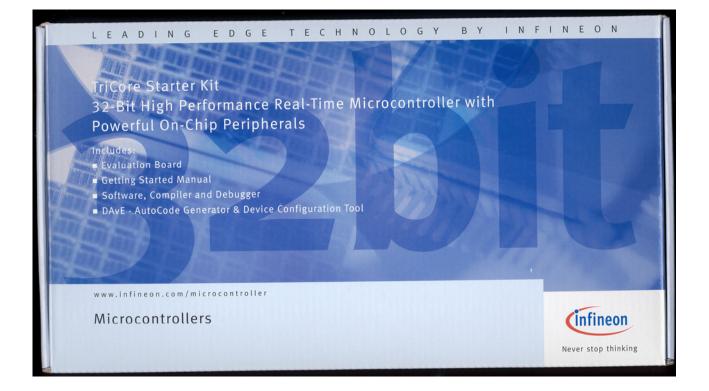
Your	
program:	
	TC1766, Program execution out of OnChipFlash: 1 LED IO_Port_1_Pin_0 ON 2 LED IO_Port_1_Pin_0 OFF 3 LED IO_Port_1_Pin_0 blinking your choice:
	▼ ▼
Chapter/ Step:	*** Recipes ***
1.)	TC1766 Board Power Supply, Jumper Setting, Serial cable to the notebook, pls-Debugger
2.)	DAvE – program generator DAvE installation (mothersystem) + DAvE Update-installation for TC1766 (DIP-file)
3.)	Using DAvE Microcontroller initialization for your programming example
4.)	Using the TASKING Development Tools (C/C++/EC++ Compiler) Programming of your application with Altium's TASKING TriCore tool chain (EDE) - v2.3r1 Locating programs into the 1,5 MByte OnChipProgramFlash (PFLASH), using OnChipSRAM)
5.)	Using the pls Debugger Using the pls Debugger to download (program into Flash) and run your program

Feedback

6.) <u>Feedback</u>	
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1.) TC1766 Starter Kit Board:

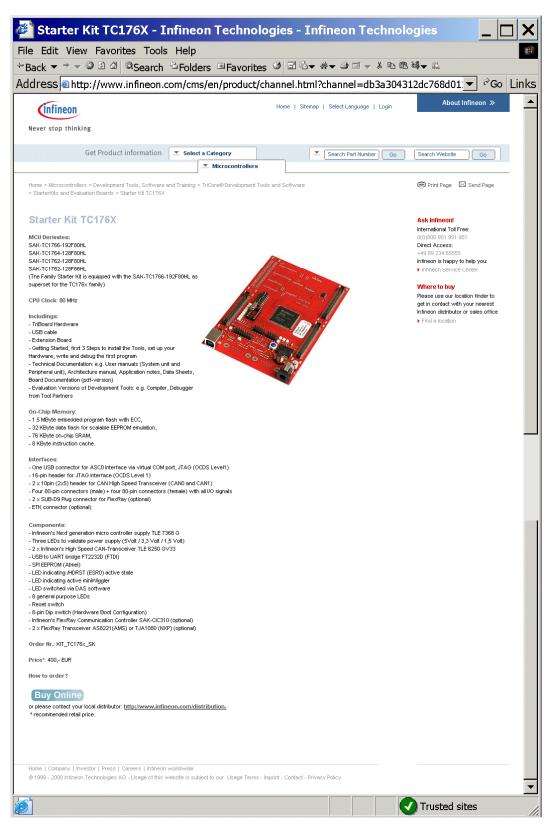






Screenshot of the TC1766 Starter Kit homepage:

http://www.infineon.com/cms/en/product/channel.html?channel=db3a304312dc768d0112e71c62150b30





Connecting the TC1766 Starter Kit:

1. Connect a Power Supply:

The TC1766 Board requires an external power supply. A (un)regulated DC power supply from 5,5 to 60 Volts can be connected to the power connector. 500 mA are sufficient for the TC1766 Starter Kit.



2. Connect a RS-232 Serial Cable

(1:1; 9-pin Sub-D plug – 9-pin Sub-D connector; the "Hello World" example uses this interface):



3. Connect the pls-Debugger (Flash-Programming und Debugging):



For further information, please refer to the TriBoard TC176X User's Manual, V1.0, June 2005.



Jumper Settings (Jumper JP501):

Source: TriBoard TC176X User's Manual, V1.0, June 2005

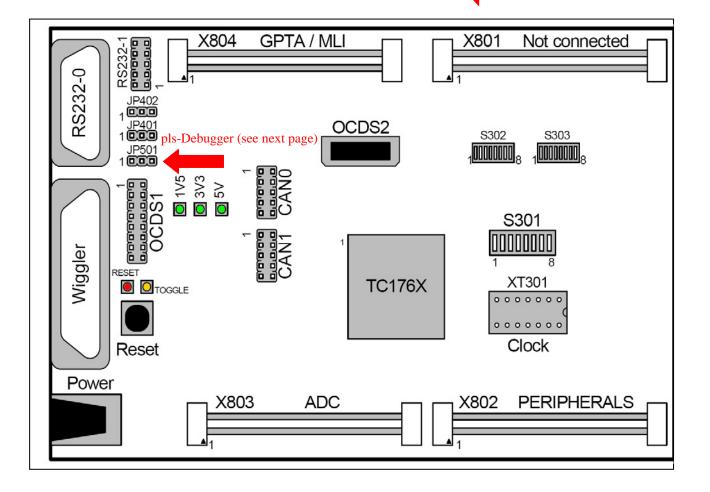
Table 5-4	Jumper for On Board Wiggler	
Note: The	shadowed line indicates the default setting	
Setting	On Board Wiggler	
1 - 2	Enable On Board Wiggler	
2 - 3	Disable On Board Wiggler	
		pls-Debugger

Jumper JP501

1-2 ... Enable On-Board Wiggler (use parallel-on-board-interface)

2-3 ... Disable On-Board Wiggler (use pls-Debugger)

pls-Debugger



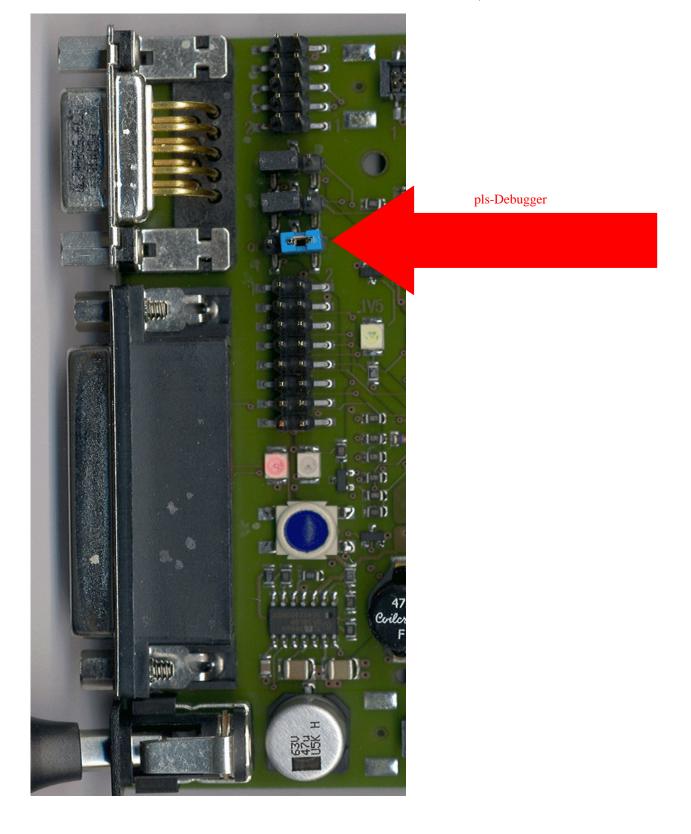


Jumper JP501

1-2 ... Enable On-Board Wiggler (use parallel-on-board-interface)

2-3 ... Disable On-Board Wiggler (use pls-Debugger)

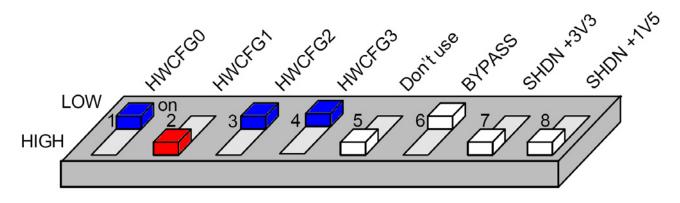
pls-Debugger

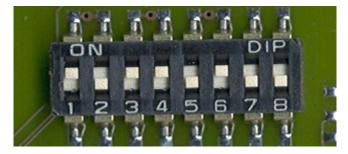




TC1766 Execution-Environment = OnChipFlash:

Jumper Settings (HW-Configuration DIP-Switch):





/BRKIN	HWCFG[30]	Type of Boot	PC Start value
1	0000	Serial boot from ASC to PMI scratchpad, run loaded program	0xD4000000
1	0001	Serial boot from CAN to PMI scratchpad, run loaded program	0xD4000000
1	0010	Start from internal flash	0xA000000
1	0011	Alternate Bootmode from internal flash	from Header or 0xD4000000
1	1000	Internal Start in EEC SRAM, if ED	0xAFF20000
1	1111	Serial boot from ASC via CAN pins to PMI scratchpad, run loaded program	from Header or 0xD4000000
1	all others	reserved; don't use this combination	-
0	0000	put chip in tristate (deep sleep)	-
0	all others	reserved; don't use this combination	-

HW Configuration DIP-Switch: 1, 3, 4, 6 : ON 2, 5, 7, 8 : OFF



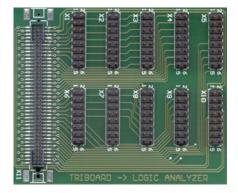
08/01 RIBOARD - TC1 OK Z FKT C 0 000 0 0 0 C 0 1 1 -H XSD 425 930

TC1766 Execution-Environment = OnChipFlash:



Accessories for the TC1766 Starter Kit: Extension Boards

"TriBoard+XC16x-Adapter-Board" to have access to all microcontroller pins. <u>Stencils</u> are available with the Board



Ordering information:

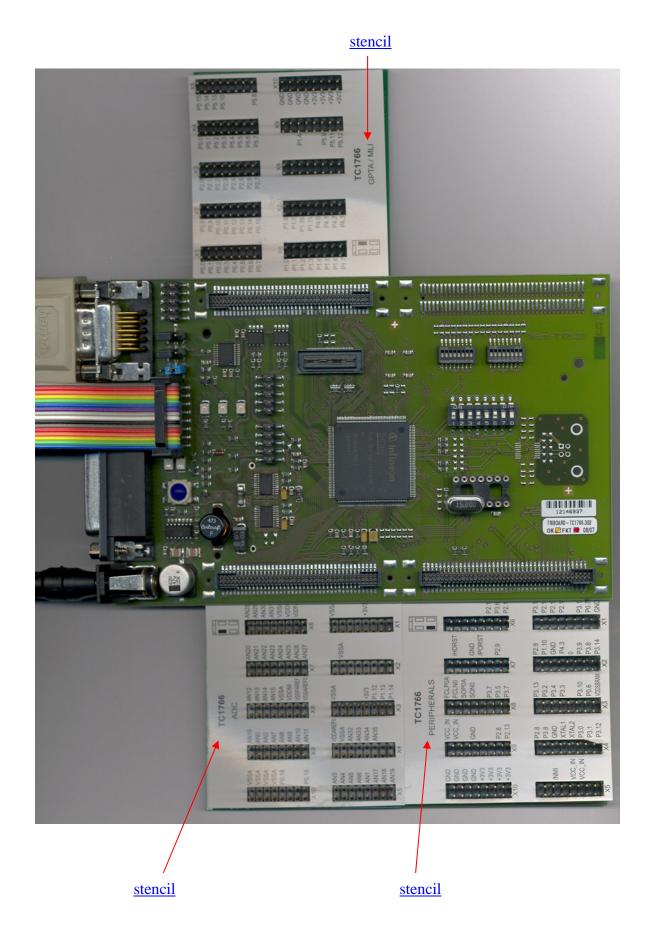
Name: TriBoard+XC16x-Adapter-Platine. The price is approximately €32 per extension board (3 required).

Purpose: extension boards are used for easy measuring of the signals on the extension connectors to have access to all microcontroller pins and/or to connect either a part of – or the entire application to the TC1766 Starter Kit.

You can order them at:

TQ Components GmbH Schulstraße 29a D-82234 Weßling Deutschland T: +49-8153-9308-161 Mr. Rolf Müller







2.) DAvE – Installation for TC1766 microcontrollers:



Install DAvE (mothersystem):

Title	Date	Version	Size
Tool Package			
DAvE - Mothersystem - latest version	05 Feb 2007	V2.1 r24	14.8 MB
DAvE - Mothersystem	04 Jul 2006	V2.1 r23	15.1 MB
and execute setup.exe to install DAvE .			

Note: Abort the installation of Acrobat Reader.





Install the TC1766 microcontroller support/update (TC1766 DIP file):

1.) Download the DAvE-update-file (.DIP) for the required microcontroller @ <u>http://www.infineon.com/DAvE</u>

itle	Date	Version	Size
levelopment Tools			^
TC179x Family DIP files for DAvE (Microcontroller Configuration Tool)-latest version (TC179x_Series_v1.1.zip)	07 Jul 2008	v1.1	19 MB
TC176x DIP file for DAvE (Microcontroller Configuration Tool)-latest version (TC176x_Series_v1.0.zip)	07 Jul 2008	v1.0	11.1 MB
TC116x family DIP file for DAvE (Microcontroller Configuration Tool)-latest version (TC116x_Series.zip)	19 Jun 2006	V0.2	8.9 MB
zip the zip-file "TC176x_series_v1.0.zip" and save " TC176 e.g. D:\DAvE\TC1766\ TC176x_Series.dip.	x_Series.dip) "	



2.)

Start DAvE - (click DAvE)

3.)

View Setup Wizard Default: • Installation Forward> Select: • I want to install products from the DAvE's web site Forward> Select: D:\DAvE\TC1766 Forward> Select: Available Products click TC176x_Series Forward> Install End

4.) DAvE is now ready to generate code for the TC1766 microcontroller.



3.) DAvE - Microcontroller Initialization after Power-On:



Start the program generator DAvE and select the TC1766 microcontroller:

File New **32-Bit Microcontrollers** TC1766 Create <u>-</u> DAvE File View Options Add-Ins Windows ? 🕬 · 🗅 🚔 🖬 🗲 🖆 🗔 🔳 💡 🚰 DAvE - New Project X 32-Bit Microcontrollers 16-Bit Microcontrollers 8-Bit Microcontrollers TC1130 TC1762 TC1764 TC1766 TC1796 Create Cancel Help



Choose the Project Settings as you can see in the screenshots:

General: Compiler Settings:

For the Tasking Compiler check/choose • Tasking in the Compiler Settings:

DAVE	. 🗆 🗙
File View Options Add-Ins Windows ?	
Image: Controller Type Type TC1766 Max. system 80 MHz	×
Main Source File File name MAIN.c Main Header File File name MAIN.h	
Compiler Settings	
⊂ GNU	
TC1766 (new project)	



System Clock: CPU Clock will be 80 MHz:

System Clock: External Clock Frequency: External clock frequency check/insert 15 [MHz]

DAVE			
File View Options Add-Ins Windows ?			
● ● ● ● ● ◆ 2 □ ■ ?			
DAVE TC1766 (Release v1.0 PM Project Settings Project Settings Ceneral System Clock Interrupt System External Clock Frequency External clock frequency External clock frequency External clock frequency I5 [MHz] Input divider (PDIV) fp = fosc / 1 = Voltage Controlled Oscillator (VCO) C VCO Bypass mode (VCOBYP) VCO range VCO range VCO range VCO SEL	DM PCP System Pad Driver St 15,000 MHz		Notes eration (fcpu = fosc) 1)
Feedback divider (NDIV) fvco = fosc /	P * 32 = 480,000 MHz ▼	VCO output frequency [MHz]	480,000
Output Divider			
Output divider (KDIV) fcpu = fvco /	6 = 80,000 MHz	CPU Clock [MHz]	80,00000000
	pu / fsys is 2 / 1 pu / fsys is 1 / 1	System Clock [MHz]	80,00000000
TC1766 (new project)			



Note:

We strongly suggest that you check first to see if your board is equipped with a 15 MHz Crystal (default).

Note:

The final result should be 80 MHz CPU Clock and 80 MHz System Clock

Application Note



Interrupt System: CPU Global Interrupt Enable: tick ✓ Enable globally the interrupt system (IE)

DAVE	
File View Options Add-Ins Windows ?	
🙀 DAvE TC1766 (Release v1.0)	
PMI	
🛜 🚰 Project Settings	×
General System Clock Interrupt System PCP System Pad Driver Startup Configuration Notes	
CPU Global Interrupt Enable	
Enable globally the interrupt system (IE)	
Number of Arbitration Cycles (CARBCYC)	
© Four arbitration cycles (max. 255 interrupt sources)	
C Three arbitration cycles (max. 63 interrupt sources)	
C Two arbitration cycles (max. 15 interrupt sources) C One arbitration cycle (max. 3 interrupt sources)	
Number of Clocks per Arbitration Cycle (CONECYC)	
 Two clocks per arbitration cycle One clock per arbitration cycle (for low frequency) 	
TC1766 (new project)	



PCP System: (do nothing)

DAVE	_ 🗆 X
File View Options Add-Ins Windows ?	
DAvE TC1766 (Release v1.0)	
PM DM DM Project Settings	×
General System Clock Interrupt System PCP System Pad Driver Startup Configuration Notes	
PCP Enable Control	
Enable globally the PCP system (EN)	
Number of Arbitration Cycles (ARBCYC)	
© Four arbitration cycles (max. 255 PCP channels)	
C Three arbitration cycles (max. 63 PCP channels)	
C Two arbitration cycles (max. 15 PCP channels)	
C One arbitration cycle (max. 3 PCP channels)	
Number of Clocks per Arbitration Cycle (ONECYC)	
C One clock per arbitration cycle (for low frequency)	
TC1766 (new project)	11.



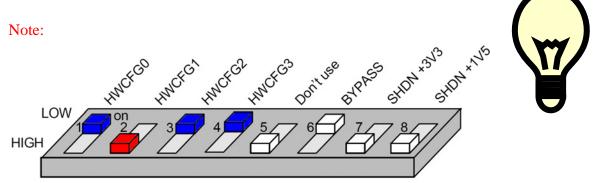
Pad Driver: (do nothing)

DAVE	_ 🗆 🗙
File <u>View Options Add-Ins Windows ?</u>	
Image: Control of the status of the statu	
TC1766 (new project)	



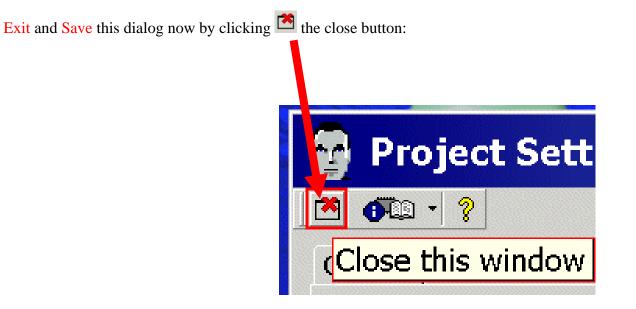
Startup Configuration: Hardware Booting Scheme: Boot type (external pins CFG[3:0]) select Normal Internal Start. Jump to internal flash (CFG[3:0] = 0010)

DAVE	
Eile View Options Add-Ins Windows ?	
DAVE TC1766 (Release v1.0)	
PM DM PM PM PM Project Settings	×
General System Clock Interrupt System PCP System Pad Driver Startup Configuration Notes	
Hardware Booting Scheme	
Normal boot mode (external pin #BRKIN = 1)	
C Emulator mode (external pin #BRKIN = 0)	
Boot type (external pins CFG[3:0])	
Normal Internal Start. Jump to internal flash (CFG[3:0] = 0010)	
TC1766 (new project)	
	//_





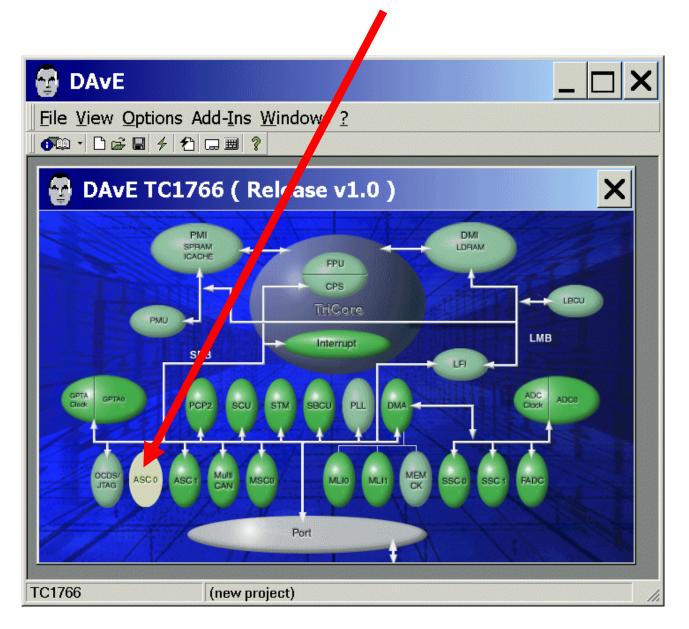
Notes: If you wish, you can insert your comments here.





Configuration of the ASC0:

The configuration window/dialog can be opened by <u>clicking</u> the specific block/module.





Note:

ASC0 is used for the serial communication with a terminal program running on your host computer.



Module Clock: Module Disable Request: untick □ Disable the ASC0 module Module Clock: Module Run Mode Clock Control: choose System clock/1 (=80,0000 MHz) Module Clock: Sleep Mode Enable Control: tick ✓ Disable the sleep mode

👻 DAVE					
File View Options Add-Ins Windows ?					
🙀 DAvE TC1766 (Release v1.0)					
PMI					
Asynchronous Synchronous Serial Interface 0 (ASC0)					
Module Clock Pin Selection Control Baud Rate Interrupts Functions Parameters Notes					
Module Disable Request Sleep Mode Enable Control					
Disable the ASC0 module (DISR) Disable the sleep mode for the ASC0 module (EDIS)					
Module Run Mode Clock Control					
Clock divider for normal operation mode (RMC) System clock / 1 (= 80,0000 MHz)					
TC1766 (new project)					



Pin Selection: Alternate Pin Selection: click Configure pins ASC0_RXD0 and ASC0_TXD0

😨 DAvE		
File View Options Add		
DAVE TC1766	Image: Control Synchronous Serial Interface 0 (ASCO) Selection Control Baud Rate Interrupts Functions Parameters Notes ng Mode (M) asynchronous operating modes C Half-duplex 8-bit synchronous operating mode lection Configure pins ASC0_RXD0 (= none) and ASC0_TXD0 (= none)	
TC1766 (n	new project)	11.



Pin Selection: Alternate Pin Selection: Configure pins ASC0_RXD0 and ASC0_TXD0: ASC0_RXD0: ASC0_RXD0 Pin Selection: click • Use pin P3.0 as ASC0 receive input signal

Pin Selection: Alternate Pin Selection: Configure pins ASC0_RXD0 and ASC0_TXD0: ASC0_RXD0: Pull Device: P3.0 pull device: select Tristate

DAVE	
File View Optic	ons Add-Ins <u>W</u> indows ? 《 카그 페
DAVE TO DAVE TO DAVE TO DAVE TO Asy Modul Ge	C1766 (Release v1.0)
	Pull Device Tristate P3.12 pull device Pull up device P1.12 pull device Pull up device
TC1766	(new project)



Pin Selection: Alternate Pin Selection: Configure pins ASC0_RXD0 and ASC0_TXD0: ASC0_TXD0: ASC0_TXD0 Pin Selection: click • Use pin P3.1 as ASC0 output signal

DAVE			
Ш.	ns Add-Ins Windows ?		
∬ 🗗 🗈 🖬 🔸			
Asyn Modul Ge	C1766 (Release v1.0) MARKAN CONTINUE Serial Interface 0 (ASCO) Configure Alternate Pin Functions Configure Alternate Pin Functions		
	ASC0_TXD0 Pin Selection		
Alt	© No pin as ASCO_TXD0 selected		
	Use pin P3.1 as ASC0 output signal (ASC0_TXD0)		
1	C Use pin P3.13 as ASC0 output signal (ASC0_TXD0)		
	Push Pull / Open Drain Driver Mode		
	□ Activate open drain function for P3.1 Driver of P3.1 Strong driver, sharp edge 💌		
	Activate open drain function for P3.13 Driver of P3.13 Strong driver, sharp edge		
TC1766	(new project)		

Exit and Save this dialog now by clicking the close button.



Control: Receiver Enable: tick ✓ Enable receiver (REN)

😨 DAvE					
File View Options Add-Ins Windows ? Image:					
DAVE TC1766 (Release v1.0)	ри				
Asynchronous Synchronous Serial Interface 0 (ASC0) •••••••••••••••••••••••••••••					
Mode Control (M)	Receiver Enable	Loopback Mode			
C 8-bit data (synchronous)	Enable receiver (REN)	□ Enable loopback mode (LB)			
© 8-bit data (asynchronous)	Stop Bit Selection (STP)	Parity Selection (ODD)			
© 7-bit data + parity (asynchronous)	One stop bit	© Even parity			
C 9-bit data (asynchronous)	○ Two stop bits	Odd parity			
C 8-bit data + wake up (asynchronous)	_ Interrupts				
© 8-bit data + parity (asynchronous)	□ Enable transmit interrupt (TSRC)				
Error Check	 Enable transmit buffer interrupt (TBSRC) □ Enable receive interrupt (RSRC) 				
 Enable overrun check (OEN) Enable framing check (FEN) 					
Enable parity check (PEN)	Enable error interrupt (ESRC)				
TC1766 (new project)					



Baud Rate: Baud Rate: Required baud rate [kBaud] insert 9,600 < ENTER > Baud Rate: Baud Rate Selection Bit / Fractional Divider: tick ✓ Use fractional divider

DAVE					_ 🗆 🗙
File ⊻iew Options Add					
PM Asynchron Compared to the synchron Compared to the synchron Com	(Release v1.0)			es]	×
 Additionally r Additionally r 	tion Bit (BRS) / Fractional D reduce serial clock to 2 reduce serial clock to 3 al divider as prescaler for bau	c	ud Rate Generato Disable baud rate Enable baud rate	e generator	
Required baud	rate [kbaud] 9,600	Real baud rat	te [kbaud]	9,600	
Fractional divid	er (n / 512) 58	- Percentage o	of deviation [%]	0,001	
Min. baud rate [baud] [1,192	- Reload value	: (RL)	0x003A	
Max. baud rate	[Mbaud] 5,000]			
TC1766 (n	ew project)				

Note:

Validate each alpha numeric entry by pressing ENTER.





Interrupts: (do nothing)

🚰 DAVE	×
File View Options Add-Ins Windows ? Image:	
DAVE TC1766 (Release v1.0)	
Asynchronous Synchronous Serial Interface 0 (ASC0)	
Module Clock Pin Selection Control Baud Rate Interrupts Functions Parameters Notes	
CPU Interrupt (max.255) PCP Interrupt (max.255)	
Level 16	
Level 15	
Level 14	
Level 13	
Level 12	
Level 11	
Level 10	
Level 9	
Level 8	
Level 7	
Level 6	
Level 5	
Level 4	
Level 3	
Level 2	
Level 1	
Note: To change the level and the group of an interrupt source, click on it, drag it to its new position and drop it. To set an interrupt source to the non interrupting level (Level 0) click on it, drag it to the 'Level 0' list and drop it	
TC1766 (new project)	



Note:

For the serial communication with a terminal program running on your host computer the myprintf function is used. The myprintf function uses Software-Polling-Mode therefore we do not need to configure any interrupts for this task.



Functions: Initialization Function: tick ✓ ASC0_vInit Functions: Function Library (Part 1): tick ✓ ASC0_vSendData Functions: Function Library (Part 1): tick ✓ ASC0_usGetData Functions: Function Library (Part 1): tick ✓ ASC0_ubTxBufFree

🔂 DAvE		
Ш	ptions Add-Ins <u>W</u> indows ?	
🛛 🌀 🔹 🗋 🔁	■ ≯ ᢓ ⊑ ▦ १	
DAVE	TC1766 (Release v1.0) Masynchronous Synchronous Serial Synchronous Synchronous Serial Control Baud Rate Interrup tialization Function ASC0_vlnit Interrup (Part 1)	Interface 0 (ASC0)
		ASC0_vReceiverOn
		ASC0_vReceiverOff
	ASC0_viTx	ASC0_vSendSlaveAdr
	ASC0_viRx	ASC0_ubOwnAddress
Г	ASC0_viError	ASC0_vWakeUp
	ASC0_viTxBuffer	ASC0_vGotoSleep
	ASC0_ubTxDataReady	■ ASC0_vSetBaudrate
		ASC0_vStopBaudGen
	ASC0_ubRxDataReady ASC0_ubErrorCheck	■ ASC0_vStartBaudGen
TC1766	(new project)	_li



Note:

You can change function names (e.g. ASC0_vInit) and file names (e.g. ASC0.c) anytime.



Parameters: (do nothing)

DAVE	_ 🗆 🗙
File <u>V</u> iew <u>Options</u> Add- <u>Ins</u> <u>W</u> indows <u>?</u>	
Ave T C1766 (Release v1.0) Module Clock Pin Selection Control Baud Rate Interrupts Functions Parameters Notes Header File File name ASCO.h	
TC1766 (new project)	

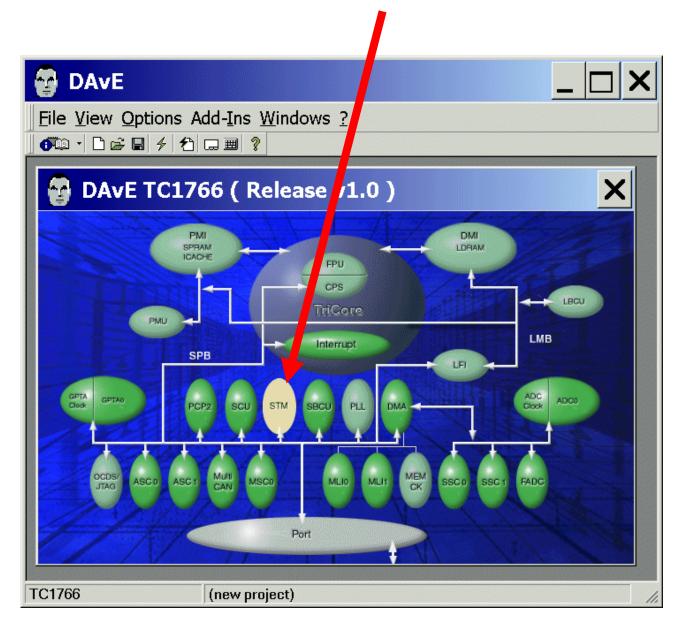
Notes: If you wish, you can insert your comments here.

Exit and Save this dialog now by clicking the close button.



Configuration of the STM:

The configuration window/dialog can be opened by <u>clicking</u> the specific block/module.



Note:

The LED on Port_1 Pin_0 will blink (after program start and if selected in the main menu) at a frequency of 1 second (done in the STM-Interrupt-Service-Routine). Therefore we now have to configure the STM.



Module Clock: Sleep Mode Enable Control: tick ✓ Disable the sleep mode for the STM module

Module Clock: Module Run Mode Clock Control: Clock divider for normal operation mode: select System clock / 4 (= 50 ns)

😨 DAvE	
File <u>View O</u> ptions Add- <u>I</u> ns <u>W</u> indows <u>?</u> ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●	
DAVE TC1766 (Release v1.0) System Timer (STM) Module Clock Resolutions CMP0 CMP1 Interrupt Control Inte Module Disable Request Slee	p Mode Enable Control Disable the sleep mode for the STM module EDIS)



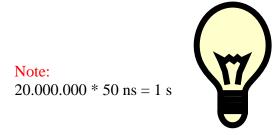
Resolutions: (do nothing)

DAv	٧E					_ 🗆 X
Ш	w Options Add-Ins Window) 🖙 🖬 🤌 🎦 🗔 🎟 🤶	ws <u>?</u>				
🔂 D/	AvE TC1766 (Releas	e v1.0)		×		
	System Timer (STM))				×
	📭 🔹 💡	CMP1 Interrupt Con	trol Interrupts I	Functions Paramete	rs Notes	
5	6-Bit System Timer					
5	6-bit system timer (TIM0, 6):	resolution [us]	0,050	range [years]	114,247	
A	Additional Parts of the System Tir	ner				
s	System timer 0 (TIM0) :	resolution [us]	0,050	range [min]	3,579	
s	System timer 1 (TIM1) :	resolution [us]	0,800	range [min]	57,266	
s s	System timer 2 (TIM2) :	resolution [us]	12,800	range [h]	15,271	
s	System timer 3 (TIM3) :	resolution [us]	204,800	range [days]	10,181	
s	System timer 4 (TIM4) :	resolution [ms]	3,277	range [days]	162,891	
s	System timer 5 (TIM5) :	resolution [ms]	52,429	range (years)	7,140	
S	System timer 6 (TIM6) :	resolution [min]	3,579	range [years]	114,247	
TC1766	(new project)					



CMP0: Compare Register Size of CMP0: Number of bits for compare: insert 25 <ENTER> CMP0: Compare Register 0: Required compare value (CMP0): insert 20000000 <ENTER>

DAVE	
File View Options Add-Ins Windows ? Image:	
DAVE TC1766 (Release v1.0) System Timer (STM) Module Clock Resolutions CMP0 CMP1 Interrupt Control Interrupts Functions Parameters Notes Start Bit Location of CMP0 Lowest bit number (0 to 24) of STM which is compared with the content of register CMP0 bit 0 (MSTART0) Compare Register Size of CMP0	
Number of bits (1 to 32) in register CMP0 (starting from 0), which are used for the compare operation with STM (MSIZE0) 25 Compare Register 0 Required compare operation 0x01312D00 Real compare value (dependent of MSIZE0) 0x01312D00	
TC1766 (new project)	





CMP1: (do nothing)

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File <u>V</u> iew <u>Options</u> Add- <u>Ins</u> <u>W</u> indows <u>?</u>	
DAVE TC1766 (Release v1.0)	
System Timer (STM)	×
Module Clock Resolutions CMP0 CMP1 Interrupt Control Interrupts Functions Parameters Notes	
Start Bit Location of CMP1	
Lowest bit number (0 to 24) of STM which is compared with the content of register CMP1 bit 0 (MSTART1)	
Compare Register Size of CMP1	
Number of bits (1 to 32) in register CMP1 (starting from 0), which are used for the compare operation with STM (MSIZE1) 1	
Compare Register 1	
Required compare value (CMP1) Real compare value (CMP1) Real compare value (dependent of MSIZE1) Real compare value (dependent of MSIZE1)	
TC1766 (new project)	



Interrupt Control: Compare Register CMP0 Interrupt Control:

tick \checkmark Enable request on compare match with CMP0

Interrupt Control: Interrupt Control of STMIR0: tick ✓ Enable SRC0 interrupt

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File View Options Add-Ins Windows ? Image: I	
😭 DAvE TC1766 (Release v1.0)	×
System Timer (STM)	×
Module Clock Resolutions CMP0 CMP1	rrupt Control Interrupts Functions Parameters Notes
Compare Register CMP0 Interrupt Control	Compare Register CMP0 Interrupt Output Selection (CMP0OS) © Select interrupt output STMIR0 © Select interrupt output STMIR1
Compare Register CMP1 Interrupt Control Enable request on compare match with CMP1 (CMP1EN)	Compare Register CMP1 Interrupt Output Selection (CMP1OS) Select interrupt output STMIR0 Select interrupt output STMIR1
Interrupt Control of STMIR0	Interrupt Control of STMIR1
Enable SRC0 interrupt (SRE)	Enable SRC1 interrupt (SRE)
TC1766 (new project)	li



Interrupts: drag and drop STM SRN 0 from Level 0 to CPU Interrupt: Level 9

DAVE	
Eile View Options Add-Ins Windows ?	
DAVE TC1766 (Release v1.0)	
🗧 鍲 System Timer (STM)	X
Module Clock Resolutions CMP0 CMP1 Interrupt Control Interrupts Functions Parameters Notes	
CPU Interrupt (max.255) PCP Interrupt (max.255)	
Level 15	
Level 14	
Level 13	
Level 12	
Level 10	
Level 9 STM SRN 0	
Level 6	
Level 5	
Level 4	
Level 3	
Level 2	
Note: To change the level and the group of an interrupt source, click on it, drag it to its new position and drop it. To set an interrupt source to the non interrupting level (Level 0) click on it, drag it to the 'Level 0' list and drop it	
TC1766 (new project)	//,



The LED on Port_1 Pin_0 will blink (after program start and if selected in the main menu) at a frequency of 1 second (done in the STM-Interrupt-Service-Routine STM_viSRN0).



Functions: Initialization Function: tick ✓ STM_vInit

DAVE	
File View Options Add-Ins Windows ? ♥ □ ☞ ■ ♥ 1 □ □ ■ ♥	
DAVE TC1766 (Release v1.0)	
Module Clock Resolutions CMP0 CMP1 Interrupt Co Initialization Function STM_vInit	ontrol Interrupts Functions Parameters Notes Source File File name STM.c
Function Library (Part 1) STM_uwReadSysTmr STM_viSRN0 STM_viSRN1 STM_ubCheckCompareMatch_0 STM_ubCheckCompareMatch_11 STM_vConfigureCompareOperation	
TC1766 (new project)	

Note:

The LED on Port_1 Pin_0 will blink (after program start and if selected in the main menu) at a frequency of 1 second (done in the STM-Interrupt-Service-Routine STM_viSRN0).



Parameters: (do nothing)

DAVE	
File View Options Add-Ins Windows ? Image:	
DAVE TC1766 (Release v1.0) System Timer (STM) System Timer (STM) System Timer (STM) Module Clock Resolutions (CMP0 CMP1 Interrupt Control Interrupts Functions Parameters Notes) Header File File name STM_TIMER_0 STM_TIMER_1 STM_TIMER_3 STM_TIMER_6 STM_TIMER_6 STM_TIMER_7	
TC1766 (new project)	//,

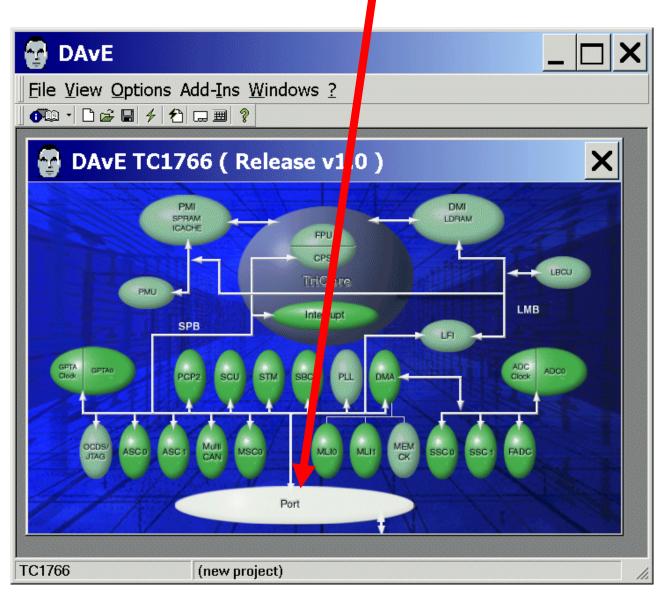
Notes: If you wish, you can insert your comments here.

Exit and Save this dialog now by clicking the close button.



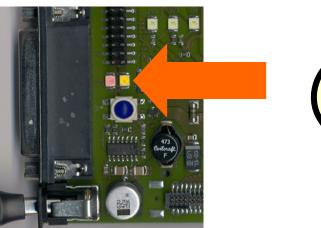
Port Configuration:

The configuration window/dialog can be opened by <u>clicking</u> the specific block/module.



Note:

The User LED (orange) is connected to Port_1 Pin_0.







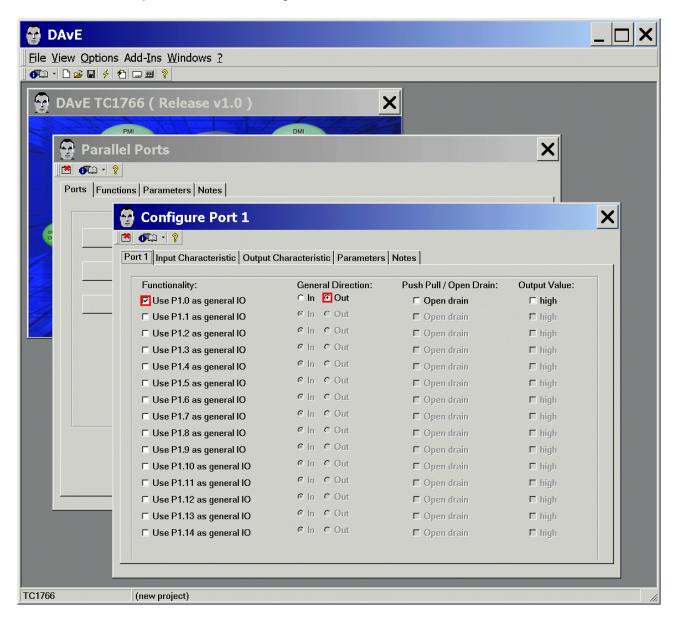
Ports: click Configure Port 1

DAVE	
File View Options Add-Ins Windows ? Image:	
DAVE TC1766 (Release v1.0) Ports Ports Configure Port 0 Configure Port 2 Configure Port 3 Configure Port 4 Configure Port 5	
TC1766 (new project)	1.



Ports: Configure Port 1:

Port 1: Functionality: tick ✓ Use P1.0 as general IO, General Direction: click ⊙ Out





Input Characteristic: (do nothing)

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	1 • <mark>8</mark>				
Ports I	Functions Parameters Notes				
	Configure Po	π⊥		_	
			1		
	Port 1 Input Characterist	tic Output Characteristic Para	meters Notes		
	Pull Device				
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	P1.1 pull device	Pull up device 💌			
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	P1.3 pull device	Pull up device 💌			
	P1.4 pull device	Pull up device 🔻			
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	P1.11 pull device	Pull up device 🔻			
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	P1.13 pull device	Pull up device 💌			
	P1.14 pull device	Pull up device 💌			
TC1766	(new project)				1.



Output Characteristic: (do nothing)

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P	ort 1 Input Characte	eristic Output Characteristic Parameters Notes	
	Output Control		
	Driver of P1.0	Medium driver	
	Driver of P1.1	Medium driver	
	Driver of P1.2	Medium driver	
	Driver of P1.3	Medium driver	
	Driver of P1.4	Medium driver	
	Driver of P1.5	Medium driver	
	Driver of P1.6	Medium driver	
	Driver of P1.7	Medium driver	
	Driver of P1.8	Strong driver, sharp edge 💌	
	Driver of P1.9	Strong driver, sharp edge 💌	
	Driver of P1.10	Strong driver, sharp edge 🔍	
	Driver of P1.11	Strong driver, sharp edge 💌	
	Driver of P1.12	Medium driver	
	Driver of P1.13	Medium driver	
	Driver of P1.14	Medium driver	
TC1766	(now project)		
101/00	(new project)		11



Parameters: (do nothing)

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Parallel Ports
Ports Functions Parameters Notes
🔮 Configure Port 1
Port 1 Input Characteristic Output Characteristic Parameters Notes
Parameters
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I0_P1_2
IO_P1_3
IO_P1_4
IO_P1_5
IO_P1_6
IO_P1_7
IO_P1_8
IO_P1_9
I0_P1_11
IO_P1_12
IO_P1_13 IO_P1_14
TC1766 (new project)

Notes: If you wish, you can insert your comments here.

Exit and Save this dialog now by clicking the close button.



Functions: Initialization Function: tick ✓ IO_vInit Functions: Function Library (Part 1): tick ✓ IO_vSetPin Functions: Function Library (Part 1): tick ✓ IO_vResetPin Functions: Function Library (Part 1): tick ✓ IO_vTogglePin

🚭 DAvE		
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TC1766 (new project)		1.



Parameters : (do nothing)

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Notes: If you wish, you can insert your comments here.

Exit and Save this dialog now by clicking the close button.

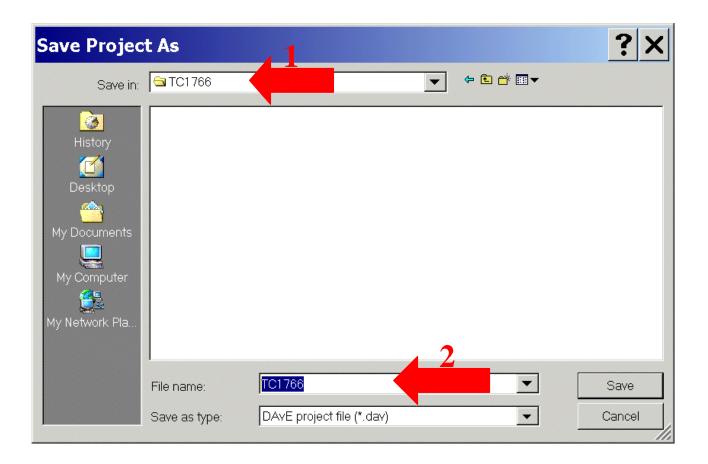


Save the project:

File Save



Save project: Save in C:\TC1766 [create new directory File name: TC1766 (2)



Save



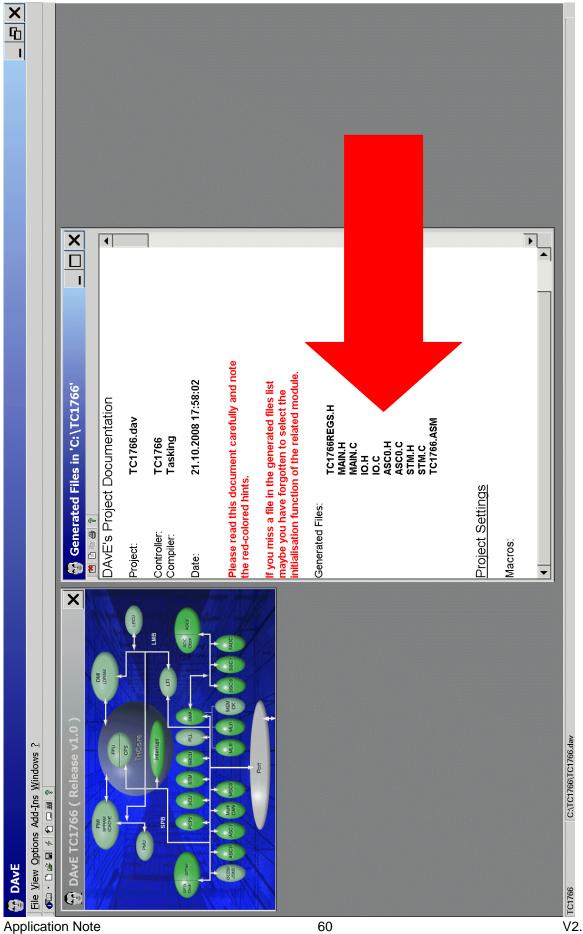
Generate Code:

File	or	click
Generate Code		4



DAvE will show you all the files he has generated (File Viewer opens automatically).







Close DAvE:

File

Exit

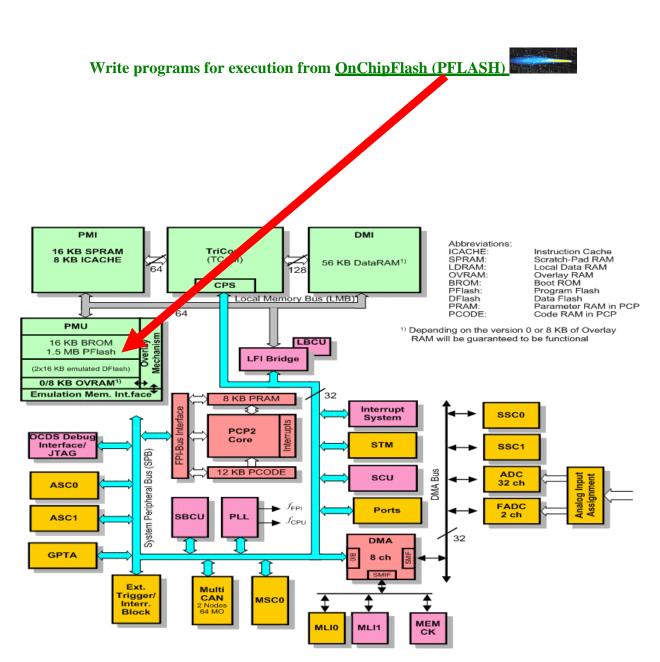
Save changes?

 $_{\text{click}} Yes$



4.) Using the TASKING - EDE Development Tools:







Install the Tasking Development Tools TriCore v2.3r1

Start Tasking EDE, select directory and include the DAvE Files:

If you see an open project - close it: File - Close Project Space

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File - Change Directory... Select a Directory: choose C:\TC1766

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TASKING EDE	TriCore VX-toolset]	
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File - New Project Space...

Create a New Project Space: Filename: insert TC1766

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Add New Project to Project Space: Filename: insert TC1766

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Image: TC1766 (0 Projects) Comparison Directories Members Tools Errors Filters Image: TC1766 (0 Projects) Project Space: C:\TC1766\TC1766.psp	
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Current Directory: C:\TC1766	
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□ ∠ Look in same directory for external makefile	
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Browse OK Cancel Help	
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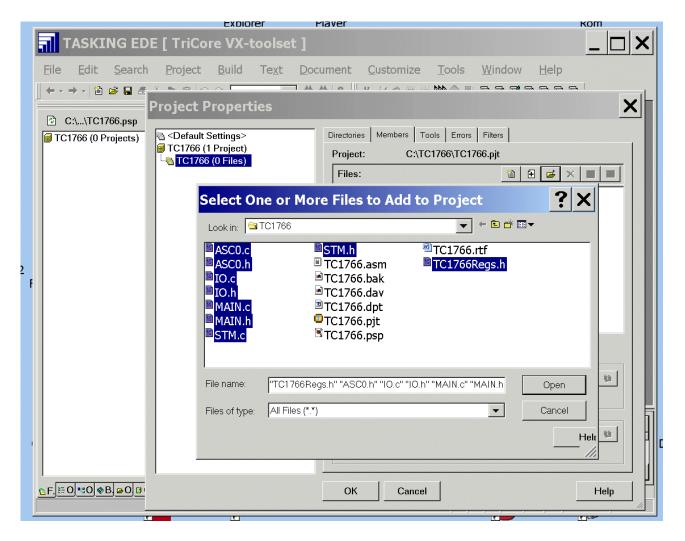


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Select One or More Files to Add to Project: select ASC0.c Select One or More Files to Add to Project: select ASC0.h Select One or More Files to Add to Project: select IO.c Select One or More Files to Add to Project: select IO.h Select One or More Files to Add to Project: select MAIN.c Select One or More Files to Add to Project: select MAIN.h Select One or More Files to Add to Project: select STM.c Select One or More Files to Add to Project: select STM.h Select One or More Files to Add to Project: select STM.h

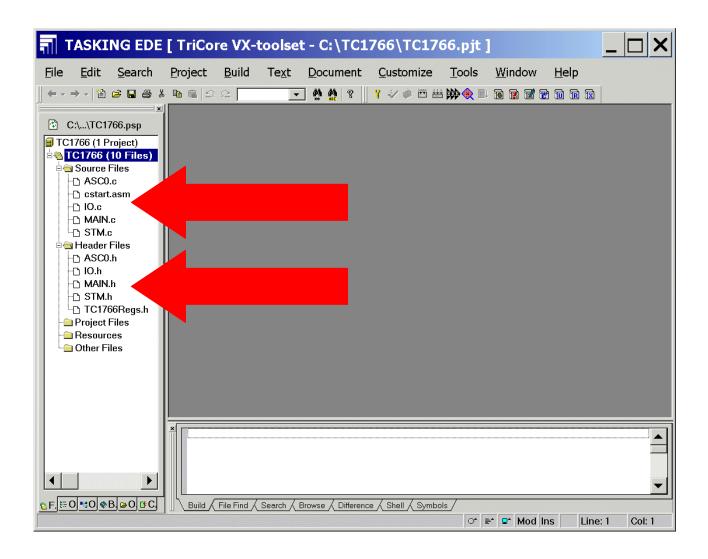


Open



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<u>©F,₩0,⊗B,∞0,₿°</u>	OK Cancel Help







Configure Compiler, Assembler, Linker, Locater and Build – Control:

Project – Project Options

Processor: Processor Definition: Target processor: select TC1766B

TriCore VX-toolset Project Op	otions [TC1766.PJT]
 Processor Processor Definition Bypasses Startup Bus Configuration C++ Compiler C Compiler Assembler PCP Assembler Linker CrossView Pro 	Processor Definition Target processor: The FPU and MMU options are only relevant for user defined processors. A possible FPU/MMU in the selected CPU will be supported regardless the state of the grayed checkbox. FPU present MMU present
	OK Cancel Default Help



Processor: Bypasses: CPU Functional Problem Bypasses: tick ✓ All bypasses TC1762/TC1764/TC1766

TriCore VX-toolset Project Op	CPU Functional Problem Bypasses TC1762/TC1764/TC1766 CPU Functional Problem Bypasses TC1762/TC1764/TC1766 CPU_TC.013 (see note) CPU_TC.060 CPU_TC.060 CPU_TC.068 CPU_TC.070 CPU_TC.071 CPU_TC.072 CPU_TC.081 CPU_TC.082
	OK Cancel Default Help

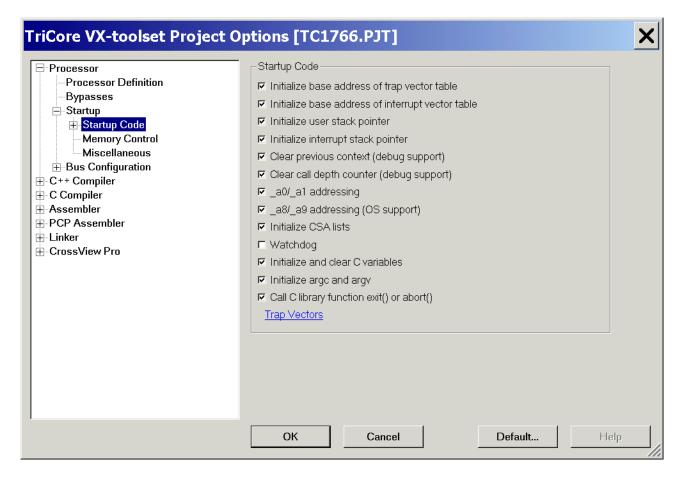


Processor: Startup: (do nothing)

TriCore VX-toolset Project Op	tions [TC1766.PJT]
 Processor Processor Definition Bypasses Startup Startup Code Memory Control Miscellaneous Bus Configuration C++ Compiler C Compiler Assembler PCP Assembler Linker CrossView Pro 	Startup When changing the system startup configuration, the system startup code (lib\src\cstart.asm) must have been added to your project. Image: Automatically copy cstart.asm to your project if none present Startup Code Boot Memory Memory Control Miscellaneous
	OK Cancel Default Help



Processor: Startup: Startup Code: (do nothing)





Processor: Startup: Startup Code: Trap Vectors: (do nothing)

TriCore VX-toolset Project O	ptions [TC1766.PJT]
 Processor Processor Definition Bypasses Startup Startup Code Trap Vectors Memory Control Miscellaneous Bus Configuration C++ Compiler C Compiler Assembler PCP Assembler Linker CrossView Pro 	Trap Vectors Trap vectors default defined within startup code: Class 0: MMU Class 1: Internal protection Class 2: Instruction error Class 3: Context management Class 4: System bus and peripheral errors Class 5: Assertion Class 6: System call Class 7: Non-maskable interrupt
	OK Cancel Default Help



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		•
Build / File Find / See		
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C Compiler: Language: (do nothing)

TriCore VX-toolset Project O	ptions [TC1766.PJT]
 Processor C++ Compiler C Compiler Preprocessing <u>Language</u> Debug Information Code Generation Optimization Allocation Warnings MISRA-C Miscellaneous Assembler PCP Assembler Linker CrossView Pro 	Language ISO C standard: C ISO 90 ISO 99 Treat 'char' variables as unsigned instead of signed Use 32-bits integers for enumeration Single precision floating point, treat type 'double' as 'float' Double precision floating point Language extensions: Allow C++ style comments in C source code Allow relaxed const check for string literals
	Options string: -Wcno-tasking-sfr -Ctc1766b -Wc-c99 -Wc-Ax -Wc-gswitch=auto -Wcalign=1 -Wc-O2 -Wc-t2inline-max-incr=35inline-max-size=10 -Wc-N8 -I"\$(PRODDIR)\include"silicon-bug=all-tc1766 OK Cancel Default Help



C Compiler: Debug Information: (do nothing)

TriCore VX-toolset Project C	ptions [TC1766.PJT]
 Processor C++ Compiler C Compiler Preprocessing Language Debug Information Code Generation Optimization Allocation Warnings MISRA-C Miscellaneous Assembler PCP Assembler Linker CrossView Pro 	Debug Information Generate symbolic debug information
	Options string: -Wcno-tasking-sfr -Ctc1766b -Wc-c99 -Wc-Ax -Wc-gswitch=auto -Wcalign=1 -Wc-O2 -Wc-t2inline-max-incr=35inline-max-size=10 -Wc-N8 -I"\$(PRODDIR)\include"silicon-bug=all-tc1766
	OK Cancel Default Help



C Compiler: Code Generation: (do nothing)

TriCore VX-toolset Projec	t Options [TC1766.PJT]
 Processor C++ Compiler C Compiler Preprocessing Language Debug Information Code Generation Optimization Allocation Warnings MISRA-C Miscellaneous Assembler PCP Assembler Linker CrossView Pro 	Code Generation Algorithm for switch statements: Choose most optimal code Minimum alignment: 1 Generate a section for each data object Call functions indirectly Call runtime functions indirectly
	Options string: -Wcno-tasking-sfr -Ctc1766b -Wc-c99 -Wc-Ax -Wc-gswitch=auto -Wcalign=1 -Wc-O2 -Wc-t2inline-max-incr=35inline-max-size=10 -Wc-N8 -I"\$(PRODDIR)\include"silicon-bug=all-tc1766
	OK Cancel Default Help



C Compiler: Optimization: Optimization level: select No optimization

C++ Compiler Optimization Preprocessing Size/speed trade-off. Language Outimization Ocde Generation Coalescer. remove unnecessary moves Code Generation Coalescer. remove unnecessary moves Optimization Coalescer. remove unnecessary moves Allocation Control flow optimization Warnings Generic assembly optimization MISRA-C Function inlining Miscellaneous Instruction scheduler PCP Assembler Instruction scheduler Uoptimization Vision string: Options string: Maximum size for functions to always inline: Options string: -Wec-no-tasking-sfr -Ctc1766b -Wec-c99 -Wec-Ax -We-gswitch=auto Wec-align=1 -Wec-00inline-max-size=10 -Wec-N8 -I*\$(PRODDIR)\include"silicon-bug=all-tc1766	Processor	Optimization
Preprocessing Language Debug Information Code Generation Optimization Allocation Warnings MISRA-C Miscellaneous PCP Assembler Linker CrossView Pro All addresses available for CSE evaluation Maximum size increment inlining: 35 Maximum size for functions to always inline: Options string: Weno-tasking-sfr -Ctc1766b -Wc-c99 -Wc-Ax -Wc-gswitch=auto -Wcno-tasking-sfr -Ctc1766b -Wc-c99 -Wc-Ax -Wc-gswitch=auto -Wcalign=1 -Wc-O0inline-max-incr=35inline-max-size=10 -Wc-N8	· ·	Optimization level: No optimization
Language Oustom optimization Code Generation Optimization Optimization Coalescer: remove unnecessary moves Allocation Common subexpression elimination (CSE) Warnings Control flow optimization and code reordering Warnings Generic assembly optimizations MISRA-C Function inlining Wiscellaneous Instruction scheduler PCP Assembler SIMD Linker All addresses available for CSE evaluation Maximum size increment inlining: 35 Maximum size for functions to always inline: 10 Options string: -Wc-no-tasking-sfr -Ctc1766b -Wc-c99 -Wc-Ax -Wc-gswitch=auto -Wc-N8		
Debug Information Code Generation Optimization Allocation Warnings MISRA-C Miscellaneous Assembler PCP Assembler E Linker CrossView Pro All addresses available for CSE evaluation Maximum size increment inlining: 35 Maximum size for functions to always inline: 10 Options string: -Weno-tasking-sfr -Ctc1766b -We-c99 -We-Ax -We-gswitch=auto -Wealign=1 -We-O0inline-max-size=10 -We-N8		
Code Generation Optimization Allocation Warnings MISRA-C Generic assembly optimization Control flow optimizations Generic assembly optimizations Function inlining Instruction scheduler CrossView Pro All addresses available for CSE evaluation Maximum size increment inlining: Maximum size for functions to always inline: Options string: Wec-no-tasking-sfr -Ctc1766b -Wec-c99 -Wec-Ax -Wec-gswitch=auto -Wec-align=1 -Wec-00inline-max-size=10 -Wec-N8	3 3	
Optimization Allocation Allocation Control flow optimization and code reordering Warnings Generic assembly optimizations MISRA-C Function inlining Miscellaneous Instruction scheduler Loop transformations SIMD CrossView Pro All addresses available for CSE evaluation Maximum size increment inlining: 35 Maximum size for functions to always inline: 10 Options string: -Wc-no-tasking-sfr -Ctc1766b -Wc-c99 -Wc-Ax -Wc-gswitch=auto -Wcalign=1 -Wc-O0inline-max-incr=35inline-max-size=10 -Wc-N8		
Allocation Warnings Warnings Generic assembly optimizations MISRA-C Function inlining Miscellaneous Instruction scheduler Loop transformations SIMD CrossView Pro All addresses available for CSE evaluation Maximum size increment inlining: 35 Maximum size for functions to always inline: 10 Options string: -Wec-no-tasking-sfr -Ctc1766b -Wec-c99 -Wec-Ax -Wec-gswitch=auto -Wecnotasking-sfr -Ctc1766b -Wec-c99 -Wec-Ax -Wec-gswitch=auto -Wec-N8	Optimization	
-Warnings Generic assembly optimizations -MISRA-C Function inlining Miscellaneous Instruction scheduler Loop transformations SIMD Linker SIMD CrossView Pro All addresses available for CSE evaluation Maximum size increment inlining: 35 Maximum size for functions to always inline: 10 Options string: -Wc-no-tasking-sfr -Ctc1766b -Wc-c99 -Wc-Ax -Wc-gswitch=auto -Wc-align=1 -Wc-O0inline-max-size=10 -Wc-N8	Allocation	
→Miscellaneous → Assembler → PCP Assembler ⊕ - CrossView Pro → All addresses available for CSE evaluation ⊕ - CrossView Pro ⊕ Options string: → Wcno-tasking-sfr - Ctc1766b - Wc-c99 - Wc-Ax - Wc-gswitch=auto -Wcnatign=1 - Wc-O0inline-max-incr=35inline-max-size=10 - Wc-N8	9	
 Assembler PCP Assembler SIMD SIMD All addresses available for CSE evaluation Maximum size increment inlining: 35 Maximum size for functions to always inline: 10 Options string: -Wcno-tasking-sfr -Ctc1766b -Wc-c99 -Wc-Ax -Wc-gswitch=auto -Wcalign=1 -Wc-O0inline-max-incr=35inline-max-size=10 -Wc-N8 		
 PCP Assembler □ SIMD □ All addresses available for CSE evaluation Maximum size increment inlining: 35 Maximum size for functions to always inline: 10 Options string: -Wcno-tasking-sfr -Ctc1766b -Wc-c99 -Wc-Ax -Wc-gswitch=auto -Wcalign=1 -Wc-O0inline-max-size=10 -Wc-N8 		
Image: Proceeding and the system of the		
CrossView Pro Maximum size increment inlining: Maximum size for functions to always inline: Options string: -Wcno-tasking-sfr -Ctc1766b -Wc-c99 -Wc-Ax -Wc-gswitch=auto -Wcalign=1 -Wc-O0inline-max-incr=35inline-max-size=10 -Wc-N8		
Maximum size increment inlining: 35 Maximum size for functions to always inline: 10 Options string: -Wcno-tasking-sfr -Ctc1766b -Wc-c99 -Wc-Ax -Wc-gswitch=auto -Wcalign=1 -Wc-O0inline-max-incr=35inline-max-size=10 -Wc-N8		
Options string: -Wcno-tasking-sfr -Ctc1766b -Wc-c99 -Wc-Ax -Wc-gswitch=auto -Wcalign=1 -Wc-O0inline-max-incr=35inline-max-size=10 -Wc-N8		Maximum size increment inlining: 35
-Wcno-tasking-sfr -Ctc1766b -Wc-c99 -Wc-Ax -Wc-gswitch=auto -Wcalign=1 -Wc-O0inline-max-incr=35inline-max-size=10 -Wc-N8		Maximum size for functions to always inline: 10
		-Wcno-tasking-sfr -Ctc1766b -Wc-c99 -Wc-Ax -Wc-gswitch=auto -Wcalign=1 -Wc-O0inline-max-incr=35inline-max-size=10 -Wc-N8



C Compiler: Allocation: (do nothing)

TriCore VX-toolset Project (Options [TC1766.PJT]
 Processor C++ Compiler C Compiler Preprocessing Language Debug Information Code Generation Optimization Allocation Warnings MISRA-C Miscellaneous Assembler PCP Assembler Linker CrossView Pro 	Allocation
	Options string: -Wcno-tasking-sfr -Ctc1766b -Wc-c99 -Wc-Ax -Wc-gswitch=auto -Wcalign=1 -Wc-O0inline-max-incr=35inline-max-size=10 -Wc-N8 -I"\$(PRODDIR)\include"silicon-bug=all-tc1766 OK Cancel Default Help



C Compiler: Warnings: (do nothing)

TriCore VX-toolset Project	Warnings Report all warnings Suppress all warnings, e.g.: 126,135,144 Treat warnings as errors
	Options string: -Wcno-tasking-sfr -Ctc1766b -Wc-c99 -Wc-Ax -Wc-gswitch=auto -Wcalign=1 -Wc-O0inline-max-incr=35inline-max-size=10 -Wc-N8 -I"\$(PRODDIR)\include"silicon-bug=all-tc1766
1	OK Cancel Default Help



C Compiler: MISRA-C: (do nothing)

Compiler MISRA-C standard: Disable MISRA-C code checking —Preprocessing Supported MISRA-C required rules —Debug Information Supported MISRA-C required and advisory rules —Code Generation Supported MISRA-C configuration —Optimization Custom MISRA-C configuration —Allocation Use external MISRA-C configuration file —Warnings Image: Ima	ocessor	MISRA-C
Complier —Preprocessing —Language —Debug Information —Code Generation —Optimization —Allocation —Warnings —Miscellaneous ssembler CP Assembler Rker rossView Pro MISRA-C required rule violation into warning MISRA-C report	++ Compiler	MISRA-C standard: Disable MISRA-C code checking
 Language Debug Information Code Generation Optimization Allocation Warnings MISRA-C Miscellaneous ssembler CP Assembler Turn required rule violation into warning Turn advisory rule violation into warning Produce a MISRA-C report MISRA-C rules 	Compiler	
- Debug Information Code Generation - Code Generation Custom MISRA-C required and advisory rules - Optimization Custom MISRA-C configuration - Allocation Use external MISRA-C configuration file - Warnings Image: Comparison of the second secon	Preprocessing	
- Code Generation ○ Custom MISRA-C configuration - Allocation ○ Use external MISRA-C configuration file - Warnings Image: Composition of the composition	Language	Supported MISRA-C required rules
- Code Generation • Custom MISRA-C configuration - Allocation • Use external MISRA-C configuration file - Warnings Image: Configuration file - Wiscellaneous Image: Configuration file - Miscellaneous Image: Configuration file Image: Configuration Image: Configuration fi	 Debug Information 	 Supported MISRA-C required and advisory rules
- Optimization - Allocation - Allocation - Use external MISRA-C configuration file - Warnings - Use external MISRA-C configuration file - Miscellaneous - Turn required rule violation into warning - Dytemate - Turn required rule violation into warning - CP Assembler - Turn advisory rule violation into warning - Nker - Produce a MISRA-C report - MISRA-C rules - MISRA-C rules	Code Generation	
-Warnings Use File MISRA-C -Miscellaneous -Miscellaneous □ Turn required rule violation into warning CP Assembler □ Turn advisory rule violation into warning nker □ Produce a MISRA-C report MISRA-C rules □	Optimization	
MISRA-C Miscellaneous ssembler CP Assembler inker rossView Pro MISRA-C rules		O Use external MISRA-C configuration file
Miscellaneous Assembler CP Assembler Linker CrossView Pro MISRA-C rules		Use File
Assembler Turn required rule violation into warning CP Assembler Turn advisory rule violation into warning inker Produce a MISRA-C report MISRA-C rules		
CP Assembler Image: Turn advisory rule violation into warning inker Image: Turn advisory rule violation into warning CrossView Pro Image: Turn advisory rule violation into warning MISRA-C rules MISRA-C rules		
inker CrossView Pro MISRA-C rules		Turn required rule violation into warning
MISRA-C rules		Turn advisory rule violation into warning
MISRA-C rules		✓ Produce a MISRA-C report
	CrossView Pro	
		MISDA Cindos
Options string:		Options string:
		-Wcno-tasking-sfr -Ctc1766b -Wc-c99 -Wc-Ax -Wc-gswitch=auto -Wcalign=1 -Wc-O0inline-max-incr=35inline-max-size=10 -Wc-N8
		-I"\$(PRODDIR)\include"silicon-bug=all-tc1766
-Wcalign=1 -Wc-O0inline-max-incr=35inline-max-size=10 -Wc-N		



C Compiler: Miscellaneous: (do nothing)

TriCore VX-toolset Project	Options [TC1766.PJT]
 Processor C++ Compiler C Compiler Preprocessing Language Debug Information Code Generation Optimization Allocation Warnings MISRA-C Miscellaneous Assembler PCP Assembler Linker CrossView Pro 	Miscellaneous Merge C-source code with assembly in output file (.src) Comment in object file: Additional options: Additional options: Options string: -Weno-tasking-sfr -Cte1766b -We-c99 -We-Ax -We-gswitch=auto -Wealign=1 -We-O0inline-max-incr=35inline-max-size=10 -We-N8 -I"\$(PRODDIR)\include"silicon-bug=all-te1766
	OK Cancel Default Help



Linker: (do nothing)

TriCore VX-toolset Project	Options [TC1766.PJT]
 Processor C++ Compiler C Compiler Assembler PCP Assembler Linker CrossView Pro 	Linker Output Format Script File Map File Libraries Optimization Warnings Miscellaneous
	Options string: format=elf -o"tc1766.elf" -d"_tc1766.lsl" -Ctc1766bsilicon-bug=all-tc1766 -WI-M -WI-mcfklMoQrSU -L"\$(PRODDIR)\lib" -WI-OCLTXY
	OK Cancel Default Help



Linker: Output Format: (do nothing)

TriCore VX-toolset Project O	ptions [TC1766.PJT]
 Processor C++ Compiler C Compiler Assembler PCP Assembler Linker Output Format Script File Map File Libraries Optimization Warnings Miscellaneous CrossView Pro 	Output Format • Absolute binary • Library for TASKING TriCore Linker (.a) • IEEE-695 (.abs) • ELF/DWARF 2 for TASKING CrossView Pro Debugger (.elf) • Motorola S records for EPROM programmers (.sre) • Intel HEX records for EPROM programmers (.hex) • Create file for each memory chip Size of addresses (bytes) for Motorola S records: G reate sets (bytes) for Intel HEX records: Hitex emulator (.htx) format (requires Hitex sptriced.exe) Cptions string: format=elf -o"tc1766.elf" -d"_tc1766.lsl" -Ctc1766bsilicon-bug=all-tc1766WI-M -WI-mcfklMoQrSU -L"\$(PRODDIR)\lib" -WI-OCLTXY
	OK Cancel Default Help



Linker: Script File: (do nothing)

TriCore VX-toolset Project O	Script File Select LSL file with memory and section description: • Generate memory and section script from EDE settings • Use project specific memory and section LSL file:
	Options string: format=elf -o"tc1766.elf" -d"_tc1766.lsl" -Ctc1766bsilicon-bug=all-tc1766 -WI-M -WI-mcfklMoQrSU -L"\$(PRODDIR)\lib" -WI-OCLTXY OK Cancel Default Help



Linker: Script File: Special Areas: RESET start address: insert 0xA0000000 (PFLASH) Linker: Script File: Special Areas: Libraries start address: insert 0xA0080000 (PFLASH) Linker: Script File: Special Areas: Interrupt table start address: insert 0xA0100000 (PFLASH) Linker: Script File: Special Areas: Trap table start address: insert 0xA0102000 (PFLASH)

Linker: Script File: Special Areas: CSA start address: insert/check 0xD0000000 (LDRAM)

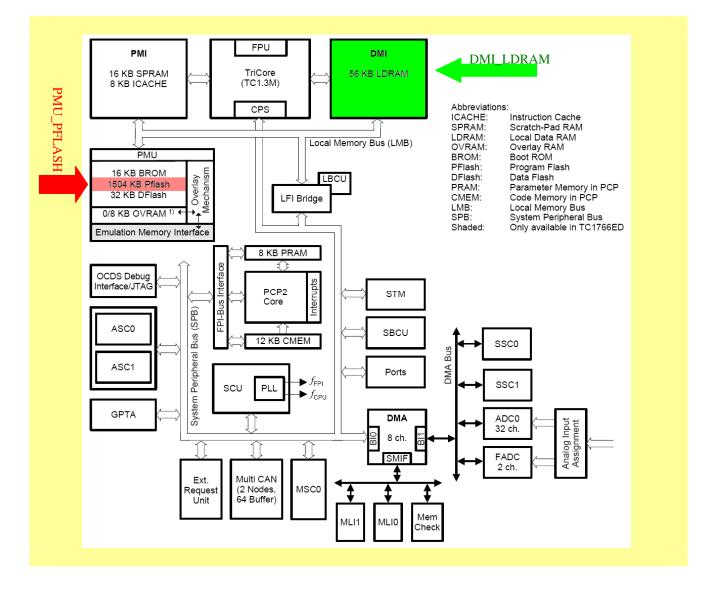
TriCore VX-toolset Project (Options [TC1766.PJT]	×
 Processor C++ Compiler C Compiler Assembler PCP Assembler Linker Output Format Script File Special Areas Defines/Stack/Heap Internal Memory External Memory Sections Output Sections Reserved Map File Libraries Optimization Warnings Miscellanenus 	Special Areas Start Addresses RESET start address: Libraries start address: Interrupt table start address: Trap table start address: CSA start address: A0 area start address: A1 area start address: A8 area start address: A9 area start address:	0xA0000000PMU_PFLASH0xA0080000PMU_PFLASH0xA0100000PMU_PFLASH0xA0102000PMU_PFLASH0xD0000000DMI_LDRAM
CrossView Pro	Options string: format=elf -o"tc1766.elf" -d"_tc -WI-M -WI-mcfklMoQrSU -L"\$(Pl OK Cancel	1766.Isl" -Ctc1766bsilicon-bug=all-tc1766 RODDIR)\lib" -WI-OCLTXY Default Help



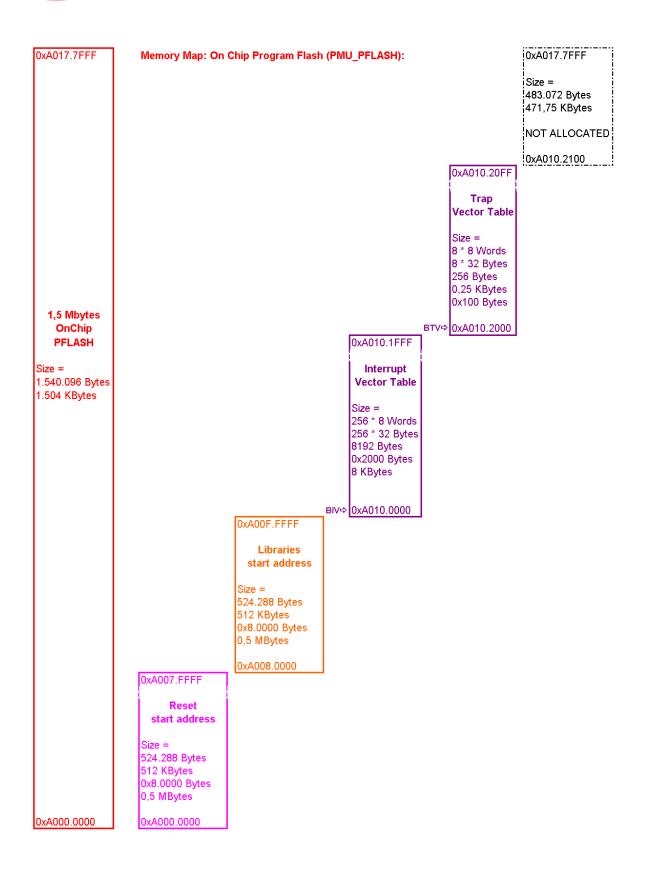


Additional information: Program Memory / Data Memory:

The On Chip **PMU_PFLASH** memory has a capacity of 1.504 KBytes: The On Chip DMI_LDRAM memory has a capacity of 56 KBytes.











Additional information: Interrupt Vector Table:

Remember:

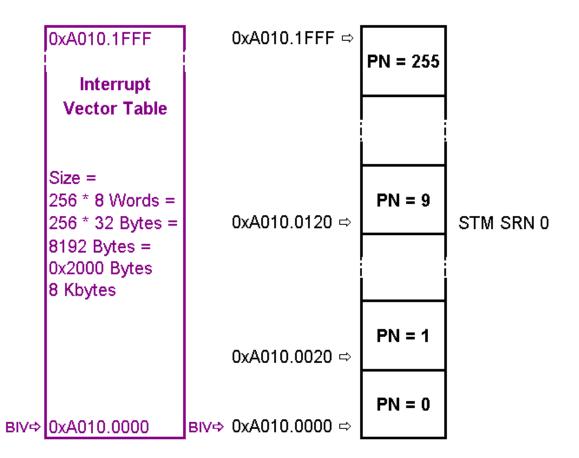
		the second s		
Sy:	stem Timer (STM)			<u>></u>
🖄 🚛	• 8			
Module (Clock Resolutions CMP0 C	MP1 Interrupt Control Interrupts	Functione Parame	tere Notee
woulde			r uncuons r arame	
	CPU Interrupt (max.255)	PCP Interrupt (max.255)	Level 0 (r	non interrupting)
Level 16	3			
Level 15	5			
Level 14	1			
Level 13	3			
Level 12	2			
Level 11	1			
Level 10)			
Level 9	STM SRN 0			
Level 8				
Level 7				
Level 6				
Level 5				
Level 4				
Level 3				
Level 2				
Level 1				





Additional information: Interrupt Vector Table:

Interrupt Vector Table:



Note: PN ... Priority Number (CPU Interrupt Level)

Note: Click here to see the Map File





Additional information: TRAP Vector Table:

TRAP Vector Table:

0xA010.2	OFF		Class_7
Trap		0xA010.20E0 ⇔	
Vector T	able	0xA010.20C0 ⇔	Class_6
		0XA010.20C0 🗢	
Size = 8 * 8 Wor		0xA010.20A0 ⇔	Class_5
8 * 32 By 256 Bytes	s =	0xA010.2080 ⇔	Class_4
0,25 KBy 0x100 By		UXAUTU.2060 ⇔	
		0xA010.2060 ⇔	Class_3
		0xA010.2040 ⇔	Class_2
		0xA010.2020 ⇔	Class_1
			Class_0
вт∨⇔ 0хА010.2	000 вт∨⊧	⇒ 0xA010.2000 ⇔	_

Note:

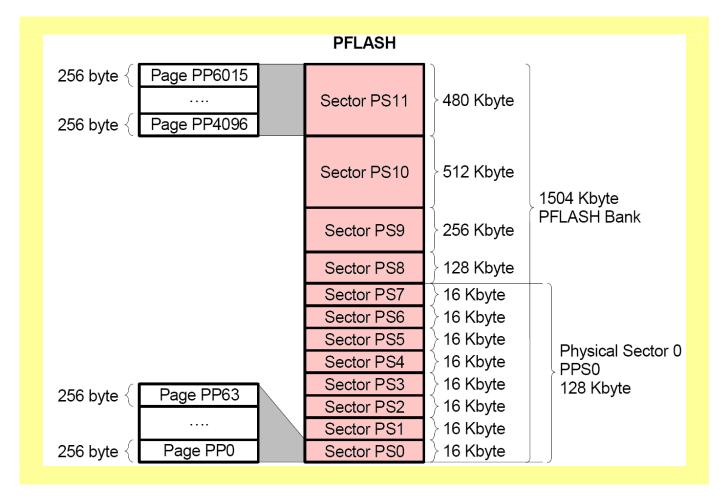
1 Word = 32 Bits 1 Word = 4 Bytes 8 Words = 32 Bytes

Note: Click here to see the Map File





The on-chip **PMU_PFLASH** memory has a capacity of 1.504 KBytes:







The on-chip PMU_PFLASH memory has a capacity of 1.504 KBytes:

Numb	ering	Size	Cached Address Range	Non-Cached Address Range	
PFLA	SH Bank				
PB	3 1504 Kbyte				A000 0000 _H - A017 7FFF _H
PFLA	SH Secto	ors			
PS0	PPS0 ¹⁾	16 Kbyte	8000 0000 _H - 8000 3FFF _H	A000 0000 _H - A000 3FFF _H	
PS1	-	16 Kbyte	8000 4000 _H - 8000 7FFF _H	A000 4000 _H - A000 7FFF _H	
PS2		16 Kbyte	8000 8000 _H - 8000 BFFF _H	A000 8000 _H - A000 BFFF _H	
PS3	-	16 Kbyte	8000 C000 _H - 8000 FFFF _H	A000 C000 _H - A000 FFFF _H	
PS4		16 Kbyte	8001 0000 _H - 8001 3FFF _H	A001 0000 _H - A001 3FFF _H	
PS5	-	16 Kbyte	8001 4000 _H - 8001 7FFF _H	A001 4000 _H - A001 7FFF _H	
PS6		16 Kbyte	8001 8000 _H - 8001 BFFF _H	A001 8000 _H - A001 BFFF _H	
PS7		16 Kbyte	8001 C000 _H - 8001 FFFF _H	A001 C000 _H - A001 FFFF _H	
PS8		128 Kbyte	8002 0000 _H - 8003 FFFF _H	A002 0000 _H - A003 FFFF _H	
PS9		256 Kbyte	8004 0000 _H - 8007 FFFF _H	A004 0000 _H - A007 FFFF _H	
PS10		512 Kbyte	8008 0000 _H - 800F FFFF _H	A008 0000 _H - A00F FFFF _H	
PS11		480 Kbyte	8010 0000 _H - 8017 7FFF _H	A010 0000 _H - A017 7FFF _H	





The on-chip PMU_PFLASH memory has a capacity of 1.504 KBytes:

it View Document	Tools Window Help				
8.3.	1 Segment	s 0 to 14			
	e 8-2 shows the a ters PCP, DMA ar		o of segments 0 to 14 as it is	s seen from	the SPB bus
Tab	e 8-2 SPB Ac	ldress Map	of Segment 0 to 14		
Seg		Size	Description	Acces	s Type
mer	t Range			Read	Write
0-7	0000 0000 _H - 0000 0007 _H	8 byte	Reserved (virtual address space)	MPN trap	MPN trap
	0000 0008 _H - 7FFF FFFF _H	8 × 256 Mbyte		SPBBE	SPBBE
8	8000 0000 _H - 8017 7FFF _H	1.5 Mbyte	Program Flash (PFLASH)	access	access ¹⁾
	8017 8000 _H - 807F FFFF _H	6.5 Mbyte	Reserved	LMBBE & SPBBE	LMBBE
	8080 0000 _H - 8FDF FFFF _H	246 Mbyte	Reserved	LMBBE & SPBBE	LMBBE
	8FE0 0000 _H - 8FE0 3FFF _H	16 Kbyte	Data Flash (DFLASH) Bank 0	access	access ¹⁾





The on-chip **PMU_PFLASH** memory has a capacity of 1.504 KBytes:

٦	Table		dress Map	of Segment 0 to 14 (cont'd		emory waps	
	Seg-	Address	Size	Description	Acces	Access Type	
r	nent	Range			Read	Write	
ç	9	9000 0000 _H - 9FFF FFFF _H	256 Mbyte	Reserved	SPBBE	SPBBE	
1	10	A000 0000 _H - A017 <mark>7</mark> FFF _H	1.5 Mbyte	Program Flash (PFLASH)	access	access ¹⁾	
		A017 8000 _H - A07F FFFF _H	6.5 Mbyte	Reserved	LMBBE & SPBBE	LMBBE	
		A080 0000 _H - AFDF FFFF _H	246 Mbyte	Reserved	LMBBE & SPBBE	LMBBE	
		AFE0 0000 _H - AFE0 3FFF _H	16 Kbyte	Data Flash (DFLASH) Bank 0	access	access ¹⁾	
		AFE0 4000 _H - AFE0 FFFF _H	48 Kbyte	Reserved	LMBBE & SPBBE	LMBBE	
		AFE1 0000 _H - AFF1 3FFF _H	16 Kbyte	Data Flash (DFLASH) Bank 1	access	access ¹⁾	
		AFE1 4000 _H - AFE1 FFFF _H	48 Kbyte	Reserved	LMBBE & SPBBE	ignore	

Note:

There is a typing error in Table 8-2, page 8-6, TC1766 User's Manual, System Units (Vol. 1 of 2). The correct address range for the 1.504 Kbyte PMU_PFLASH is $A000\ 0000_{\text{H}}$ - A017 7FFF_H.

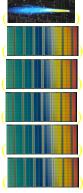


Linker: Script File: Defines/Stack/Heap: (do nothing)

Processor	Defines/Stack/Heap
C++ Compiler	Number of context blocks: 64
- C Compiler	
Assembler	Buffer size (strings in target memory): 256
⊪ PCP Assembler ⊪ Linker	User stack size: 8k
Output Format	
⊡ Script File	User stack start address:
Special Areas	Interrupt stack size: 1k
Defines/Stack/Heap -Internal Memory	Interrupt stack start address:
-External Memory	Heap size: 16k
Sections Output Sections	Heap start address:
Reserved Map File	
Libraries	
Optimization	
Warnings	
Miscellaneous	
CrossView Pro	Options string:
	format=elf -o"tc1766.elf" -d"_tc1766.lsl" -Ctc1766bsilicon-bug=all-tc1766 -WI-M -WI-mcfklMoQrSU -L"\$(PRODDIR)\lib" -WI-OCLTXY
	OK Cancel Default Help



Linker: Script File: Internal Memory: change from brom to PMU_BROM (Linker: Script File: Internal Memory: change from ovram to PMU_OVRAM (Linker: Script File: Internal Memory: change from ldram to DMI_LDRAM (Linker: Script File: Internal Memory: change from spram to PMI_SPRAM (Linker: Script File: Internal Memory: change from pram to PCP_PRAM (Linker: Script File: Internal Memory: change from pram to PCP_PRAM (



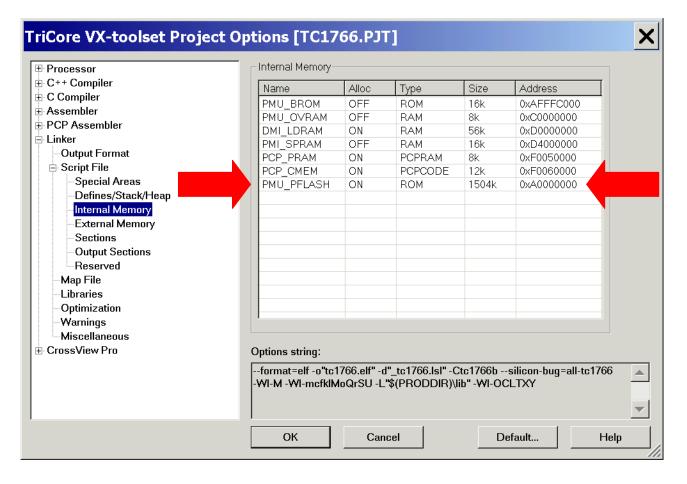
X

TriCore VX-toolset Project Options [TC1766.PJT]

+ Processor	Internal Memory-				
C++ Compiler	Name	Alloc	Туре	Size	Address
🗄 C Compiler	PMU_BROM	OFF	ROM	16k	0xAFFFC000
Assembler	PMU OVRAM	OFF	RAM	8k	0xC0000000
PCP Assembler	DMI_LDRAM	ON	RAM	56k	0xD0000000
Linker	PMI_SPRAM	OFF	RAM	16k	0xD4000000
Output Format	PCP PRAM	ON	PCPRAM	8k	0xF0050000
😑 Script File	PCP CMEM	ON	PCPCODE	12k	0xF0060000
-Special Areas					
Defines/Stack/Heap					
-Internal Memory					
-External Memory					
Sections					
-Output Sections					
Reserved					
- Map File					
Libraries					
Optimization					
Warnings	1				
Miscellaneous					
🗄 CrossView Pro	Options string:				
		1700 101 1		17001	···· · · · · · · · · · · · · · · · · ·
	tormat=eit-oftc -WI-M -WI-mcfkIM				-silicon-bug=all-tc1766
		100130-L	φ(ΓΚΟΟΟΙΚ)(Ι	ID -441-O	
	ок	Can		- F	efault Help
	OK	Can	501	L	

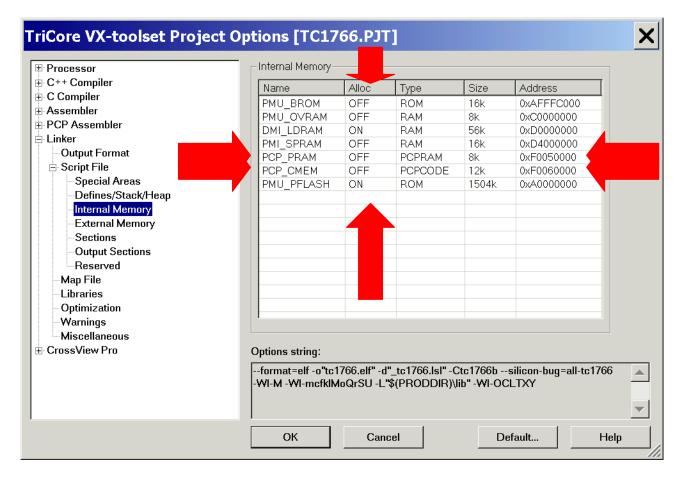


Linker: Script File: Internal Memory: Name: insert PMU_PFLASH Linker: Script File: Internal Memory: Alloc: select ON Linker: Script File: Internal Memory: Type: select ROM Linker: Script File: Internal Memory: Size: insert 1504k Linker: Script File: Internal Memory: Address insert 0xA0000000



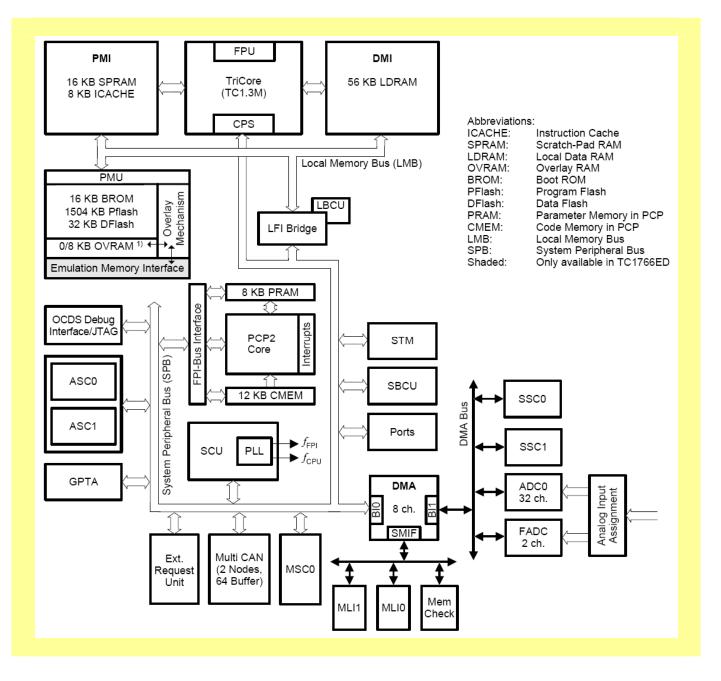


Linker: Script File: Internal Memory: Name=PCP_PRAM: Alloc: select OFF Linker: Script File: Internal Memory: Name=PCP_CMEM: Alloc: select OFF











Linker: Script File: External Memory: (do nothing)

TriCore VX-toolset Project	External Memory
 Processor C++ Compiler C Compiler Assembler PCP Assembler Linker Output Format Script File Special Areas Defines/Stack/Heap Internal Memory External Memory Sections Output Sections Reserved Map File Libraries Optimization Warnings Miscellaneous CrossView Pro 	No external memory available for this derivative
	Options string: format=elf -o"tc1766.elf" -d"_tc1766.lsl" -Ctc1766bsilicon-bug=all-tc1766 -WI-M -WI-mcfklMoQrSU -L"\$(PRODDIR)\lib" -WI-OCLTXY
	OK Cancel Default Help



Linker: Script File: Sections: (do nothing)

r	-Sections-					
piler	Space	Sections	Group	Сору	Alloc	Location
npiler		00000113	aroup	0007	7 4100	Location
nbler						
sembler						
Format						
le						
cial Areas						
fines/Stack/Heap						
ernal Memory						
rnal Memory ions						
ections						
d						
5u						
9 S						
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Linker: Script File: Reserved: (do nothing)

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Linker: Map File: tick ✓ Memory usage info

 C C++ Compiler C Compiler Assembler PCP Assembler Linker Cuink info Linker Special Areas Defines/Stack/Heap Internal Memory External Memory Sections Output Sections Reserved Map File Link result info Overlay info Memory Usage info Ø Verlay info Module local symbols Ø Cross View Pro Options string: 	₽ Processor	Map File
	 C++ Compiler C Compiler Assembler PCP Assembler Linker Output Format Script File Special Areas Defines/Stack/Heap Internal Memory External Memory Sections Output Sections Reserved Map File Libraries Optimization Warnings Miscellaneous 	✓ Generate a map file (.map) Map file contains following information: ○ Link info ○ Locate info ○ Custom ✓ Call graph info ○ Processed files info ○ Link result info ○ Locate result info ○ Overlay info ○ Overlay info ○ Cross reference info ○ Cross reference info ○ Processor and memory info
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Note: Click here to see Memory usage info



Linker: Script File: Libraries: (do nothing)

FriCore VX-toolset Proje	ct Options [TC1766.PJT]
🕀 Processor	Libraries
E C++ Compiler	✓ Link default C libraries
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Assembler	Rescan libraries to solve unresolved externals
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Output Format	Libraries (use [<name>,] for [lib<name>.a,]):</name></name>
🖨 Script File	
- Special Areas	
Defines/Stack/Heap	
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Reserved	
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Miscellaneous	
🗄 CrossView Pro	Options string:
	format=elf -o"tc1766.elf" -d"_tc1766.lsl" -Ctc1766bsilicon-bug=all-tc1766 -WI-M -WI-mcfklmoQrSU -L"\$(PRODDIR)\lib" -WI-OCLTXY
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Linker: Script File: Optimization: (do nothing)

<pre></pre>	TriCore VX-toolset Project O	ptions [TC1766.PJT]
format=elf -o"tc1766.elf" -d"_tc1766.lsl" -Ctc1766bsilicon-bug=all-tc1766	 C++ Compiler C Compiler Assembler PCP Assembler Linker Output Format Script File Special Areas Defines/Stack/Heap Internal Memory External Memory Sections Output Sections Reserved Map File Libraries Optimization Warnings Miscellaneous 	 Delete unreferenced sections Use first fit decreasing algorithm Emit smart restrictions Delete duplicate code
OK Cancel Default Help	⊕ CrossView Pro	format=elf -o"tc1766.elf" -d"_tc1766.lsl" -Ctc1766bsilicon-bug=all-tc1766 -WI-M -WI-mcfklmoQrSU -L"\$(PRODDIR)\lib" -WI-OCLTXY



Linker: Script File: Warnings: (do nothing)

TriCore VX-toolset Project O	otions [TC1766.PJT]
 Processor C++ Compiler C Compiler Assembler PCP Assembler Linker Output Format Script File Special Areas Defines/Stack/Heap Internal Memory External Memory Sections Output Sections Reserved Map File Libraries Optimization Warnings Miscellaneous CrossView Pro 	Warnings Report all warnings Suppress all warnings, e.g.: 126,135,142 Treat warnings as errors Options string:
	format=elf -o"tc1766.elf" -d"_tc1766.Isl" -Ctc1766bsilicon-bug=all-tc1766 -WI-M -WI-mcfkImoQrSU -L"\$(PRODDIR)\lib" -WI-OCLTXY
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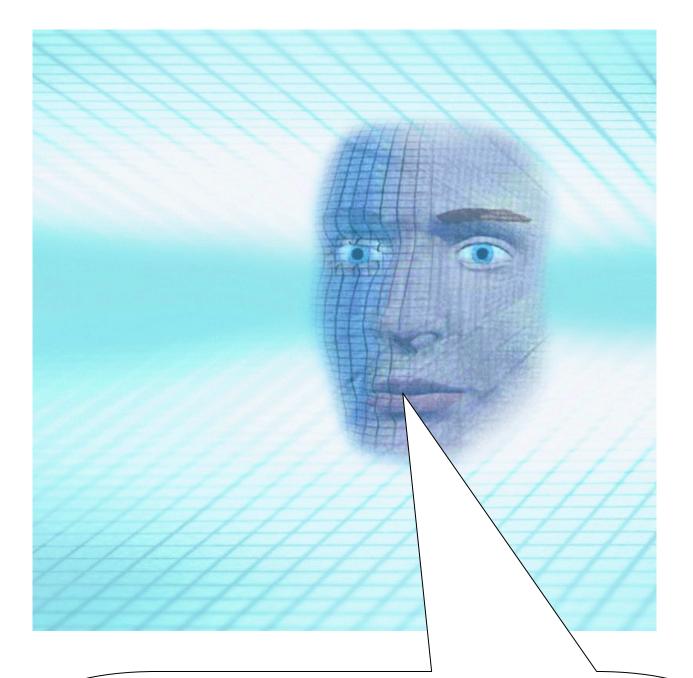
Linker: Script File: Miscellaneous: (do nothing)

🗄 Processor	Miscellaneous
C++ Compiler C Compiler C Compiler C Compiler C Assembler C Doutput Format C Script File C Special Areas C Defines/Stack/Heap C Internal Memory C External Memory C External Memory C Sections C Output Sections	 Include symbolic debug information Print the name of each file as it is processed Link case sensitive (required for C language) Use standard copy-table for initialization Additional options:
- Warnings Miscellaneous ⊕ CrossView Pro	Options string:
	format=elf -o"tc1766.elf" -d"_tc1766.lsl" -Ctc1766bsilicon-bug=all-tc1766 -WI-M -WI-mcfkImoQrSU -L"\$(PRODDIR)\lib" -WI-OCLTXY

OK



Insert your application specific program:



Note:

DAVE doesn't change code which is inserted between '// USER CODE BEGIN' and '// USER CODE END'. Therefore, whenever adding code to DAVE's generated code, write it between '// USER CODE BEGIN' and '// USER CODE END'. If you wish to change DAVE's generated code or add code outside these 'USER CODE' sections, you will have to insert/modify your changes each time after letting DAVE regenerate code!



Double click: Main.c insert User Code (Global Variables):

```
const char menu[] =
\n n n n'
"TC1766, Program execution out of OnChipFlash:\n"
"1 ... LED IO_Port_1_Pin_0 ON\n"
"2 ... LED IO_Port_1_Pin_0 OFF\n"
"3 ... LED IO Port 1 Pin 0 blinking\n"
" \n";
const char question[] =
"your choice: ";
const char message1[] =
"\n\r*** LED is ON ***\r\n";
const char message2[] =
"n^*** LED is OFF ***r^";
const char message3[] =
"\n\r*** LED is BLINKING ***\r\n";
volatile int RS232 wait=2;
volatile unsigned int blinking=ON;
char select='`';
```



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TC1766 (1 Project) TC1766 (10 Files) ASCO.c C cstart.asm D.c MAIN.c STM.c Header Files ASCO.h D.h MAIN.h STM.h TC1766Regs.h Project Files Resources Other Files	<pre>// USER CODE EEGIN (MAIN_General,7) const char menu[] = "\n\n\n\n" "TOL766, Program execution out of OnChipFlash:\n" "" " LED I0_Port_1_Pin_0 ON\n" "2 LED I0_Port_1_Pin_0 blinking\n" " \u00ed \u</pre>
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Double click: Main.c insert User Code (function: input()):

```
char input (void)
{
     char in=' ';
     do
     {
         myprintf(question);
         // ASC0_RSRC_SRR ... ASC0_Receive Interrupt Service Request Control Register_Service Request Flag
         // ASC0_RSRC_CLRR ... ASC0_Receive Interrupt Service Request Control Register_Request Clear Bit
         while (!ASC0_RSRC_SRR) ;
         ASC0_RSRC_CLRR=1; // Clear SRR bit
         in = (unsigned char)ASC0_RBUF;
         }while (in!='1' && in!= '2' && in != '3');
         return in;
         }
}
```

TASKING EDE	[TriCore VX-toolset - C:\TC1766\TC1766.pjt] - [C:\TC1 💶 🗖 🗙
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	// USER CODE BEGIN (Main,4)
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Double click: Main.c insert User Code:

```
while(RS232_wait);
while(1)
{
    myprintf(menu);
select=input();
    switch (select)
    {
        case '1': blinking=OFF, IO_P1_0=LED_ON, myprintf(message1); break;
        case '2': blinking=OFF, IO_P1_0=LED_OFF, myprintf(message2); break;
        case '3': blinking=ON, myprintf(message3); break;
    }
}
```

TASKING EDE	[TriCore VX-toolset - C:\TC1766\TC1766.pjt] - [C:\TC1 💶 🗖 🗙
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× C:\\TC1766.psp	// USER CODE BEGIN (Main,7)
TC1766 (1 Project)	// USER CODE END
TC1766 (10 Files)	default:
- ASC0.c	// USER CODE BEGIN (Main,8)
-⊡ cstart.asm -∩ IO.c	// USER CODE END
-D MAIN.c	MAIN_vInit();)
└─ <u>D</u> STM.c □	// USER CODE BEGIN (Main,9)
-⊡ ASC0.h -⊡ IO.h	<pre>while(RS232_wait); while (1)</pre>
- MAIN.h	
-⊡ STM.h -⊡ TC1766Regs.h	<pre>myprintf(menu); select=input();</pre>
- Project Files	switch (select)
	<pre>case '1': blinking=0FF, I0_P1_0=LED_0N, myprintf(messagel); break;</pre>
	<pre>case '2': blinking=OFF, I0_P1_0=LED_OFF, myprintf(message2); break; case '3': blinking=ON, myprintf(message3); break;</pre>
) // USER CODE END
	return (swReturn);
) // End of function main
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Double click: Main.h and insert the following Defines:



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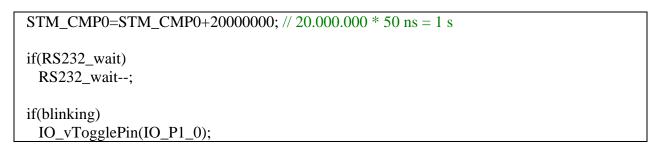
Double click: Main.h and insert Global Variables:

```
extern volatile unsigned int blinking;
extern volatile int RS232_wait;
```

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C:\\TC1766.psp	// @Imported Global Variables //***********************************
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Source Files	// USER CODE END
-D cstart.asm -D IO.c	//************************************
□ MAIN.c □ STM.c □ ← Header Files	// USER CODE BEGIN (MAIN_Header,7) extern volatile unsigned int blinking;
-D ASCO.h	extern volatile int RS232_wait; // USER CODE END
-D MAIN.h	//************************************
TC1766Regs.h	//*************************************
Project Files Resources Other Files	void MAIN_vWriteWDTCON0(uword uwValue);
	// USER CODE BEGIN (MAIN_Header,8) // USER CODE END
	//************************************
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Double click: STM.c insert User Code for interrupt service routine:



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	Image: Code and the second
TC1766 (1 Project) TC1766 (10 Files) Source Files Contemporal State S	<pre>{ // USER CODE BEGIN (SEN0,2) // USER CODE END if(STM_ICR_CMPOIR = 1) // if compare match of CMPO is pending { // USER CODE BEGIN (SEN0,3) STM_CMPO=STM_CMPO+2000000; // 20.000.000 * 50 ns = 1 s if(RS232_wait; if(blinking) IO_VTOgglePin(IO_P1_0); // USER CODE END STM_ISER_CMPOIRE = 1; // clear request bit of CMPO } if(STM_ICR_CMPIR = 1; // clear request bit of CMP1 is pending { // USER CODE BEGIN (SEN0,4) // USER CODE END STM_ISER_CMPIRE = 1; // clear request bit of CMP1 } // USER CODE END STM_ISER_CMPIRE = 1; // clear request bit of CMP1 } // USER CODE END STM_ISER_CMPIRE = 1; // clear request bit of CMP1 } // USER CODE END STM_ISER_CMPIRE = 1; // clear request bit of CMP1 } // USER CODE END STM_ISER_CMPIRE = 1; // clear request bit of CMP1 } // USER CODE END STM_ISER_CMPIRE = 1; // clear request bit of CMP1 } // USER CODE END STM_ISER_CMPIRE = 1; // clear request bit of CMP1 } // USER CODE END STM_ISER_CMPIRE = 1; // clear request bit of CMP1 } // USER CODE END STM_ISER_CMPIRE = 1; // clear request bit of CMP1 } // USER CODE END STM_ISER_CMPIRE = 1; // clear request bit of CMP1 } // USER CODE END STM_ISER_CMPIRE = 1; // clear request bit of CMP1 } // USER CODE END STM_ISER_CMPIRE = 1; // clear request bit of CMP1 } // USER CODE END STM_ISER_CMPIRE = 1; // clear request bit of CMP1 } // USER CODE END </pre>
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Note:

20.000.000 * 50 ns = 1 s To get an STM interrupt every 1 second you must change the Compare Value to "STM_CMP0+=20000000;"!





Reason for "myprintf.c"

August 2003

Unfortunately, a low-level I/O implementation similar to example project "IO" (which consists of "serio.c" and "serio.h" files for generating an output stream for "printf" using ASCO) using tool chain C166/ST10 is currently not available for Tasking TriCore tools. For the moment, Tasking has only got the following "Change Request":

CR32186 CR: Example for _write function implementation using serial interface.

DESCRIPTION

Change request for a low-level I/O (_write function implementation) example which does not use simulated I/O but uses the real serial interface of the controller.

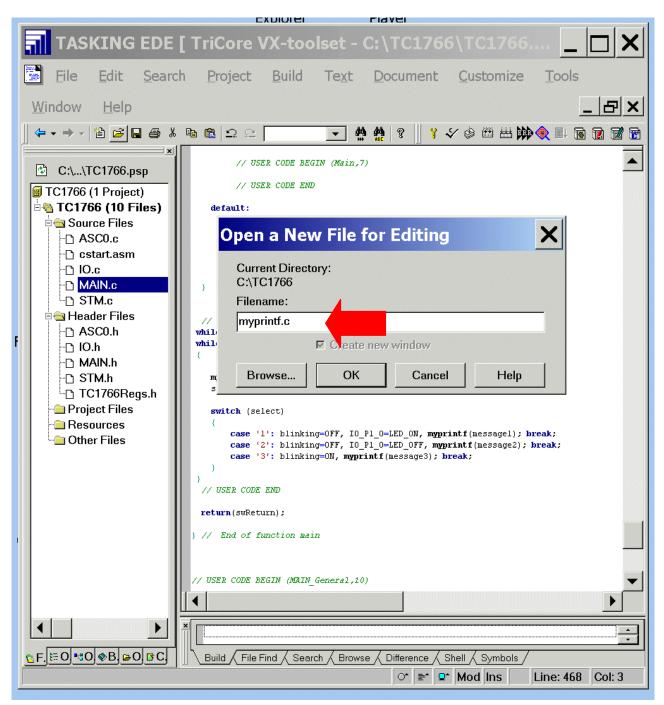
EXAMPLE

WORKAROUND



File-New

Open a New File for Editing: Filename: insert myprintf.c



OK



Insert User Code for myprintf():

```
#include "main.h"
#include "ASC0.H"
void myprintf(const char *p)
{
  while(*p)
  {
    if (ASC0_ubTxBufFree())
       ASC0_vSendData(*p++);
  }
}
/*
// Example 1 (use of myprintf):
void main(void)
{
   myprintf("Hello World!\r\n");
}
// Example 2 (use of myprintf):
void main(void)
{
  char mb[200]; // message buffer for sprintf()
  int dummy;
  sprintf(mb,"Variable wait = %d",dummy); // Write formatted data to string mb
  myprintf(mb);
}
*/
```



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] ⇔ • → • 渣 😂 🔒 👗	
C:\\TC1766.psp	<pre>#include "main.h" #include "ASCO.H" </pre>
IC1766 (1 Project) □	<pre>void myprintf(const char *p) { while(*p) }</pre>
Source Files	(
cstart.asm 10.c)) /*
-⊡ MAIN.c -⊡ STM.c	// Example 1 (use of myprintf): void main(void)
ia Header Files -⊡ ASC0.h	<pre>wyprintf("Hello World/\r\n"); } // Example 2 (use of myprintf):</pre>
⊡ IO.h ⊡ MAIN.h	void main(void) {
-D STM.h -D TC1766Regs.h	<pre>char mb[200]; // message buffer for sprintf() int dummy;</pre>
Project Files Resources Other Files	<pre>sprintf(mb,"Variable wait = %d",dummy); // Write formatted data to string mb myprintf(mb); }</pre>
Other Files	*/
	Build / File Find / Search / Browse / Difference / Shell / Symbols /
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File - Save all

(Project Window File View) – TC1766 (Files) – right mouse button click – Add Existing Files – Browse

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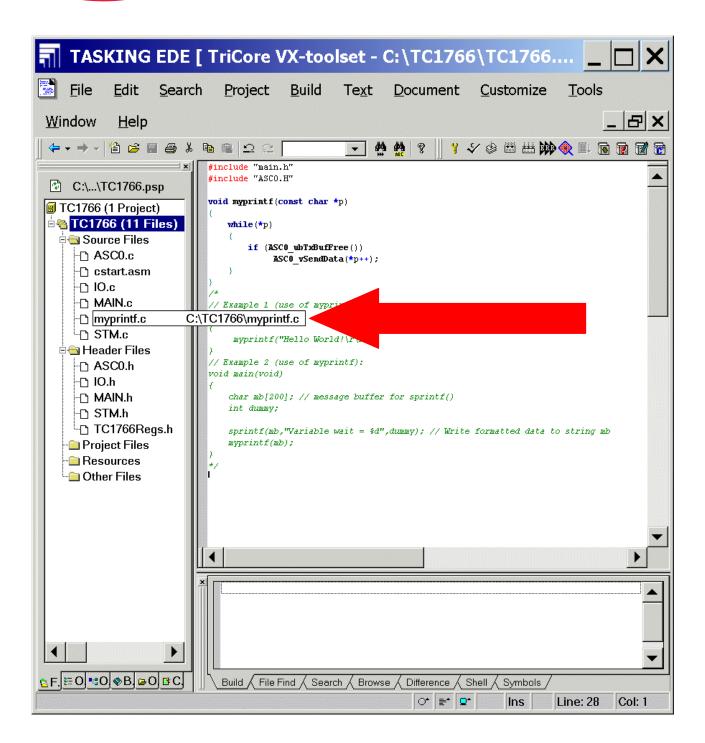


Select myprintf.c

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★ C:\\TC1766.psp	<pre>#include "main.h" #include "ASCO.H"</pre>		
TC1766 (1 Project)	<pre>void myprintf(const char *p) {</pre>		
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	<mark>t One or More Files</mark> t	o Add to Project	? X
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Open - OK







Double click: Main.h and insert Prototypes of Global Functions:

extern void myprintf(const char *p); TASKING EDE [TriCore VX-toolset - C:\TC1766\TC1766.... File Edit Build Tools Search Project Text Document Customize _ B × Window <u>H</u>elp 😓 🗸 🤿 🖓 🖻 😹 🔚 🚔 👗 🖻 🛍 🛄 💭 📿 [🔽 👯 🥵 🤋 🔢 🎸 🛷 🕮 🖽 🗰 🍓 💷 🔞 🔞 🗭 🐨 // USER CODE BEGIN (MAIN Header,7) X • extern volatile unsigned int blinking; C:\...\TC1766.psp extern volatile int RS232_wait; // USER CODE END TC1766 (1 Project) 🗄 🝓 TC1766 (11 Files) 🖻 🔄 Source Files // @Prototypes Of Global Functions - ASC0.c -🗅 cstart.asm void MAIN vWriteWDTCON0(uword uwValue); -D IO.c D MAIN.c myprintf.c // USER CODE BEGIN (MAIN Header, 8) STM.c extern void myprintf(const char *p); 🗄 🔄 Header Files // USER CODE END -D ASCO.h -🗅 IO.h - MAIN.h // @Macro MAIN_vSetENDINIT() 🗅 STM.h L TC1766Regs.h // @Description This macro sets the EndInit bit, which controls access to system critical registers. Setting the EndInit bit locks 🖻 Project Files all EndInit protected registers. 11 🚞 Resources 🗀 Other Files // @Returnvalue None / *@Parameters* None > 4 • © F.⊞O SO ⊗B 🔤 O 🖪 C. , Build 🗸 File Find 🖌 Search 🖌 Browse 🖌 Difference 🖌 Shell 🖌 Symbols , Inserted from the clipboard. ା ≣* ⊒* Mod Ins Line: 149 Col: 37



Double click: Main.h and insert required Header for sprintf:

#include <stdio.h> // for sprintf (for myprintf)

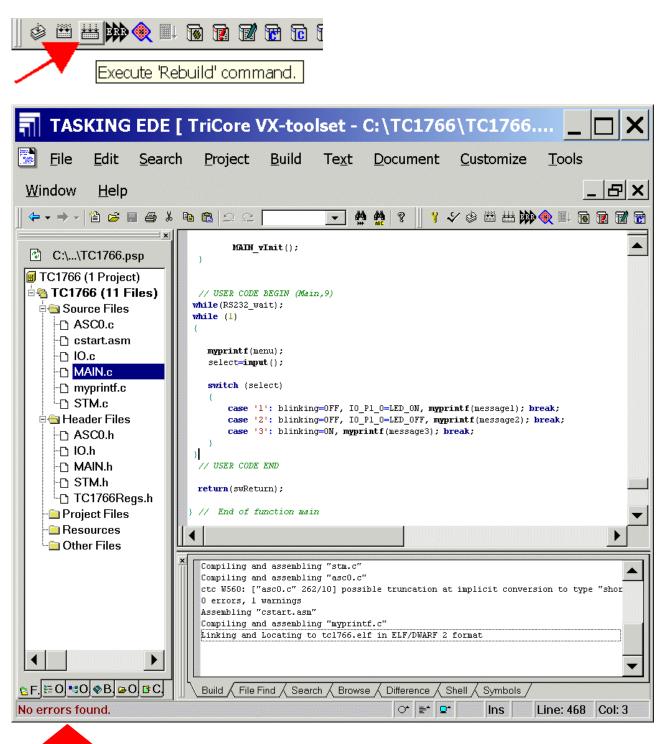
	[TriCore VX-toolset - C:\TC1766\TC1766 🗖 🗙
🔚 <u>F</u> ile <u>E</u> dit <u>S</u> earc	h <u>P</u> roject <u>B</u> uild Te <u>x</u> t <u>D</u> ocument <u>C</u> ustomize <u>T</u> ools
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<u>⊆</u> F.₩0,%B, ₽ 0, B C,	Build / File Find / Search / Browse / Difference / Shell / Symbols /
Inserted from the clipboard	. O* ≣* Q* Mod Ins Line: 221 Col: 50



Generate your application program:

Build - Rebuild

or







Insert Map File:

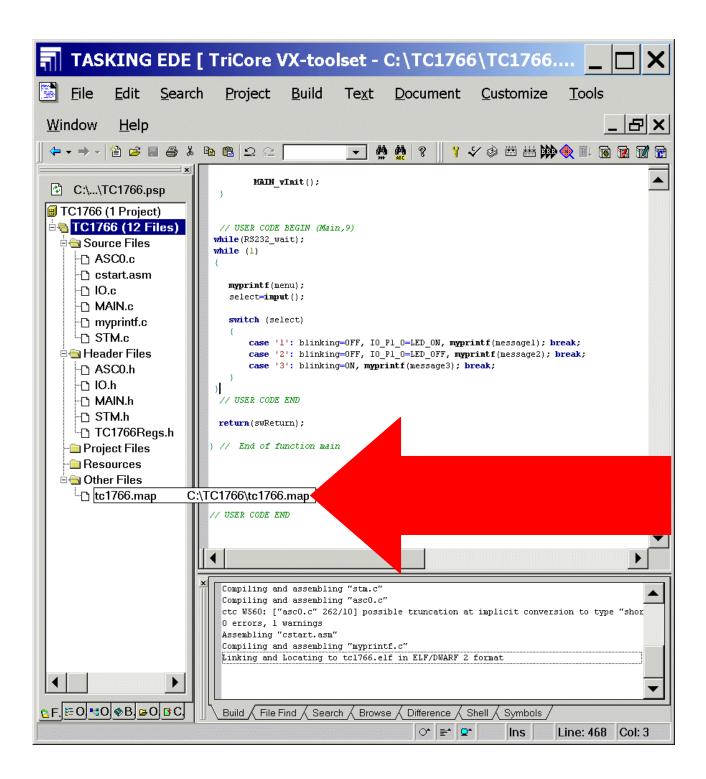
(Project Window File View) – TC1766 (Files) – right mouse button click – Add Existing Files – Browse

Select TC1766.map

Select Or	ne or More Files t	to Add to Project	? X
Look in: 🔁	TC1766	+	• Ē 💣 Ⅲ▼
MAIN.c MAIN.h main.o main.src mconfig myprintf. myprintf.		IC1766.da IC1766.dp Ic1766.elf Ic1766.err Ic1766.err Ic1766.ma	av 🖻 tc1766.or ot TC1766.p 🖻 TC1766.p 🖤 TC1766.rl nk 🖻 TC1766.s
•			•
File name:	tc1766.map		Open
Files of type:	All Files (*.*)		Cancel

Open - OK







See Map File:

Interrupt Vector Table:

TASKING EDE	[TriCore VX-toolset - C:\TC1766\TC1766.pjt] - [C:\TC17 💶 🗖 🗙
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C:\\TC1766.psp TC1766 (1 Project) TC1766 (12 Files) Source Files C: ASCO.c C: C: C	- 1. debug_line 0.000007dd 0x00000000 + Space spe:tc:linear - - 1. debug_line - - 0.000007dd 0x00000000 0x00000000 - - 0.0000007dd 0x00000000 0x00000000 - - 0.0000007dd 0x00000000 0x00000000 - - 0.0000007dd 0x00000000 0x00000000 - - 0.00000000 0x00000000 0x00000000 - - 0.00000000 0x00000000 0x00000000 - - 0.00000000 0x00000000 0x000000000000000 - - - 0.00000000 0x000000000 0x00000000000000000000000000000000000
	Compiling and assembling "stm.c" Compiling and assembling "asc0.c" ctc W560: ["asc0.c" 262/10] possible truncation at implicit conversion to type "short unsigned int" 0 errors, 1 warnings Assembling "cstart.asm" Compiling and assembling "myprintf.c" Linking and Locating to tcl766.elf in ELF/DWARF 2 format
⋸₣.≌О≝О⊗₿₽О₿С	Build / File Find / Search / Browse / Difference / Shell / Symbols /
File: C:\TC1766\tc1766.map	○ ■ ■ Ins Line: 224 Col: 104

Note: Click here to see Memory Map



Trap Vector Table:

			L766.pjt] - [C:\TC17	
Eile Edit Search ← → → → ≧ ≥ ■ ⊕ & ■ C:\\TC1766.psp		··· · · · · · · · · · · · · · ·	omize <u>T</u> ools <u>W</u> indow <u>H</u> elp	_ & ×
TC1766 (1 Project) TC1766 (12 Files) Source Files Catart.asm D.c MAIN.c MAIN.c STM.c Header Files ASCO.h D.A MAIN.h STM.h TC1766Regs.h Project Files Catart Ca	+ Chip Group	<pre> .text.libc.reset .data.libc .todta.main .text.asc0.ASC0_usGetData .text.asc0.ASC0_vSendData .text.asc0.ASC0_vSendData .text.asc0.ASC0_vSendData .text.main.Gata .text.main.WaIN_vFint .text.main.MaiN_vFinteWDTCONO .text.main.MaiN_vFinteWDTCONO .text.main.MaiN_vFinteWDTCONO .text.main.MaiN_vFinteWDTCONO .text.main.MaiN_vFinteWDTCONO .text.main.MaiN_vFinteWDTCONO .text.main.MaiN_vFinteWDTCONO .text.main.MaiN_vFinteWDTCONO .text.main.MaiN_vFinteWDTCONO .text.stm.STM_vInit .text.stm.STM_vInit .text.stm.STM_vInit .text.stm.STM_vINIt .text.stm.STM_vINIt .text.libcs .text.libcs .text.libcs .text.trapvec.000 .text.trapvec.001 .text.trapvec.004 .text.trapvec.005 .text.trapvec.007 _xvvbuffer ustack</pre>	Size (MAU) Space addr Chip addr 0x0000008 0xa0000002 0x00000000 0x00000014 0xa0000022 0x00000020 0x00000116 0xa0000150 0x00000150 0x00000116 0xa0000150 0x00000150 0x00000114 0xa0000154 0x00000151 0x00000114 0xa0000154 0x00000154 0x00000156 0xa0000154 0x00000154 0x00000156 0xa0000154 0x00000404 0x00000156 0xa0000464 0x00000405 0x00000056 0xa0000464 0x00000578 0x00000052 0xa0000578 0x00000578 0x00000052 0xa0000578 0x00000561 0x00000052 0xa0000578 0x00000561 0x00000052 0xa000058 0x00000561 0x00000052 0xa0000768 0x00000766 0x00000072 0xa0000768 0x00000766 0x00000024 0xa0000768 0x00000766 0x00000014 0xa0000220 0x00000760 0x00000014 0xa0000220 0x0000000 0x00000014 0xa0000220 0x0000000 0x00000014 0xa0102020 0x00102000 0x00000018 0xa010200 0x00102000 0x0000018 0xa0102000 0x00102000 0x00000000000 0x0000104 0x00001040 0x000010200 0x00000000000000000000000000000000000	
× F. ₩ 0 \$B ≥ 0 B C.	Compiling and assembling Compiling and assembling ctc W560: ["asc0.c" 262/J 0 errors, 1 warnings Assembling "cstart.asm" Compiling and assembling	"stm.c" "asc0.c" [0] possible truncation at implici "myprintf.c" :cl766.elf in ELF/DWARF 2 format	t conversion to type "short unsigned int"	
File: C:\TC1766\tc1766.map				2 Col: 114

Note: Click here to see Memory Map



Memory Usage:

TASKING EDE	[TriCore VX-toolset - C:\TC1766\TC1766.pjt] - [💶 🗖 🗙
Eile Edit Search	n <u>P</u> roject <u>B</u> uild Te <u>x</u> t <u>D</u> ocument <u>C</u> ustomize <u>T</u> ools <u>W</u> indow
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TC1766 (1 Project)	* Address range usage at space level
C1766 (12 Files) Cource Files Cource File	+
-D MAIN.c -D myprintf.c -D STM.c	spe:tc:linear 0x00195000 0x000040e6 2 0x00190fla 98 0x0007fe6c 31 spe:tc:pcp_code 0x0001800 0x00000000 0 0x00001800 100 0x00001800 100 spe:tc:pcp_data 0x0000800 0x00000000 0 0x00000800 100 0x00000800 100 ++
e der Files -	* Address range usage at memory level +
 Ho.n MAIN.h STM.h TC1766Regs.h Project Files Resources Other Files tc1766.map 	Name Total Used (abs) (%) Free (abs) (%) > free gap (abs) (%) spe:DMI_LDRAM 0x0000e000 0x0000354 24 0x0000aab4 76 0x0000aab0 76 spe:PCP_CMEM 0x00003000 0x00000000 0 0x00000000 100 0x00002000 100 spe:PCP_PRAM 0x00002000 0x00000000 0 0x00002000 100 0x00002000 100 spe:PMI_SPRAM 0x00004000 0x00000000 0 0x00004000 100 0x00004000 100 spe:PMU_PRAM 0x00002000 0x00000000 0 0x00004000 100 0x00004000 100 spe:PMU_PRAM 0x00002000 0x00000000 0 0x00004000 100 0x00004000 100 spe:PMU_PRAM 0x00002000 0x00000000 0 0x00002000 100 0x00004000 100 spe:PMU_PRAM 0x0002000 0x00000000 0 0x00002000 100 0x00002000 100 spe:PMU_PFLASH 0x00178000 0x00000009a 1 0x00177466 99 0x0007fe6c 34 +
	Compiling and assembling "stm.c" Compiling and assembling "asc0.c" ctc W560: ["asc0.c" 262/10] possible truncation at implicit conversion to type "short unsigned : 0 errors, 1 warnings Assembling "cstart.asm" Compiling and assembling "myprintf.c" Linking and Locating to tc1766.elf in ELF/DWARF 2 format
<u>©</u> F.₩0 ™ 0⊗B≥0₽C	Build File Find Search Browse / Difference / Shell / Symbols /
File: C:\TC1766\tc1766.map	O* E* Q* Ins Line: 439 Col: 86



Now you can close your project and Tasking EDE:

File - Close Project Space File - Exit



5.) Programming is now complete. You can now load and run your program:



Start pls-Debugger

👫 UDE Desktop	_ & ×
Eile Edit Show Config Window Help	
For Help, press F1	



File – New Workspace

F	UDE Desktop	
	File Edit Show Confia Window Help	
	Greate new UDE Workspace File to store Session Settings	
e	Look in: 🔁 TC1 766	
3: 4 42.	History Desktop	
111 111 1		ly
	For Help, press F1	

Open



		• • •
F	WW UDE Desktop	
	File Edit Select Target Configuration	
_	Last Used Browse	
e	Folder to browse :	
	C\TC1766\	
Э	Files in folder : 🔽 Show descriptions	
5	Hint	
<u>א</u> רא איי קיי	Press 'Default' to use one of the predefined configuration files. Press 'New' to create a new configuration file from scratch.	
	ОК	
	Default New Copy Edit Remove	
	OK Cancel Help	I
	For Help, press F1	

Click OK

Press Default



Create or use default: • Use a default target configuration: expand Debugger

🕅 UDE Desktop	
File Edit Show Confia Window Help	
Select Last Files • Create a new target configuration step by step • Use a default target configuration • Debugger • ARM7 • ARM9 • Cl8CBC • Excl8X	
For Help, press F1	(leaner



Create or use default: • Use a default target configuration: select Triboard with TC1766 (JTAG/OCDS)

7		• •
rF	WW UDE Desktop	
	File Edit Sele	
	Last L Folde CATC Files CATC Files CATC Files Catching Ca	
	<pre></pre>	1
	For Help, press F1	

Click Finish



New Target Configuration: Save in: select C:\TC1766 (1) New Target Configuration: File name: change/insert TC1766 (2)

۲ ۲	UDE Desktop	
	File Edit Select Target Configuration	
Ξ	New Target Configuration	
e	Save in: 🔁 TC1766	
31	TC1766.CS_ History	
\$ <u></u> } } } }	Desktop My Documents My Computer My Network Pla	
	File name: TC1766.cfg Save as type: Target Config Files (*.cfg) OK Cancel	
•	For Help, press F1	

Save



F	UDE Desktop
	File Edit ! Select Target Configuration % In C G %
E	Last Used Browse Folder to browse : C:\TC1766\
	Files in folder : Image: Show descriptions Triboard with TC1766 (JTAG/OCDS)
3 A 42.	
	Default New Copy Edit Remove OK Cancel Help
	For Help, press F1

OK



UDE Desktop - C:\TC1766\tc176	6.wsp - Controller0.Core - Command View	w
ile Edit Debua Show Views Tools Confia Win	dow Macro Help	
· ha 🛍 🎒 🗋 🖆 💐 🚔 🚔 🔡 🐄 😓 📕 🗐 🖼 😽	* 5 ¥ 5 5 5 5 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0	💌 🚽 🗢 🕶 🖽 🖓 🕀 🅫 🗷 🗷 🖷 🕚 Controller0
MSG: Workspace: Workspace file C:\T MSG: Workspace: Actual ude release		
4SG: Workspace: Additional ude upda	te version: (none)	
<pre>MSG: Workspace: Target configuration MSG: Controller0.Core::UAD2CommDev:</pre>		
ASG: CONCLOTIERO.COPE::OAD2COMMDev:	walt for restart UAD2 (4 sec)	
	TriCore JTAG/OCDS Debug Protocol, V3.8.4	
MSG: Controller0.Core::UDEMemtool: FLASH programming for device '1,5 MByte OnChip Program FLASH' ready MSG: Controller0.Core::UDEDebugServer: Connection to TC1766 target monitor established: TriCore (Core), ID: 2		
	2	
Command		
Commanu		
· Help, press F1	Controller0.Core C:\TC1766\TC1766.cfg Controlle	



Config – Add-In Components

UDE Desktop - C:\TC1766\tc1766.wsp - Controller0.Core				
File Edit Debug Show Views Tools Config Window Macro Help				
X № @ @ D @ ₩ ₩ ≦ ઍ 🖽 % አ	Customize Bars			
	<u>W</u> orkbook			
[Target Configuration			
	Setup HTML Browser			
	<u>A</u> dd-In Components			
	Debug Server Configuration			
	Target Interface			



UDE Add-In Components Load State:

UDE Add-In Component Description check/tick ✓ FLASH/OTP Memory Programming Tool

	W UDE Desktop - C:\TC1766\tc1766.wsp - Controlle X File Edit Debua Show Views Tools Confia Window Macro Help ※ < @ @ @ @ @ @ @ @ @ @ @ @ @ @ @ @ @ @	
2	UDE Add-In Component Description Δ μC/OS Support CAN Recorder Case Tools Connection Support DAVE Version 2.x Support DMA Ocds L2 Support FLASH/OTP Memory Programming Tool MCDS Trace Support PXROS Support TriCore OCDSL2 Support TTF Recorder	Di
	□ Delete stored settings after unload Help OK Cancel	P
	MSG: Controller0.Core::UAD2CommDev: TriCore JTAG/OCDS Debug Pr MSG: Controller0.Core::UDEMemtool: FLASH programming for devic MSG: Controller0.Core::UDEDebugServer: Connection to TC1766 ta	
	For Help, press F1 Controller0.Core C:\TC1766\TC	

OK



Tools – FLASH Programming ...

🚺 UDE Desktop - C:\TC1766\tc1766.wsp - Controlle 💶 🗖 🗙			
File Edit Debug Show Views Tools Config Window Macro Help			
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	Macros		
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	■ <u>R</u> un selected Macro		
	Break Macro		
	TReload selected Ma	cro	
	FLASH Programming	g	
	Execution Time Set	up	
MSG: Controller0.Core:	:UDEMemtool: FLAS	Core JTAG/OCDS Debug Pr BH programming for devic Connection to TC1766 ta	
Open FLASH programming inte	rface	Controller0.Core C:\TC1766\TC	



FLASH/OTP – Memory Device: check/select 1,5 MByte OnChip Program FLASH FLASH/OTP – Memory Device: check/tick ✓ Enable

M UDE Desktop - C:\TC1766\tc1766.wsp - C	ontroller0.Core - Command V	iew _ 🗖 🗙	
File Edit Debua Show Views Tools Confia Window Macro Help			
	Ş, # = 3 = 2 = 1 % 1 ∞ 1 1	▼	
UDE - FLASH/OTP Memory Programm	ning Tool	×	
FLASH/OTP - Memory Device			
1,5 MByte OnChip Program FLASH	Enable	Exit	
#0: 0xA0000000 - 0xA001FFFF (128K) #1: 0xA0020000 - 0xA003FFFF (128K)	Remove All Erase	About	
#2: 0xA0040000 - 0xA007FFFF (256K) #3: 0xA0080000 - 0xA00FFFFF (512K)	Remove Sel. Program	Help	
#4 : 0xA0100000 - 0xA0177FFF (480K)	Verify	General	
	Protect		
	SW Prot.	Program All	
* Sector is protected	Info Setup	Verify All	
MSG: Controller0.Core::UAD2CommDev: TriCore JTAG/OCDS Debug Protocol, V3.8.4, ID 1 opened MSG: Controller0.Core::UDEMemtool: FLASH programming for device '1,5 MByte OnChip Program FLASH MSG: Controller0.Core::UDEDebugServer: Connection to TC1766 target monitor established: TriCore			
For Help, press F1 Control	ler0.Core C:\TC1766\TC1766.cfg Contro	oller0.Core halted by user bre 🏼 🎢	



Click Setup ...

👗 UDE - FLASH/OTP Memory Programming	Tool	×
FLASH/OTP - Memory Device 1,5 MByte OnChip Program FLASH #0 : 0xA0000000 - 0xA001FFFF (128K) #1 : 0xA0020000 - 0xA003FFFF (128K) #2 : 0xA0040000 - 0xA007FFFF (256K) #3 : 0xA0080000 - 0xA00FFFFF (512K) #4 : 0xA0100000 - 0xA0177FFF (480K)	▼ Enable Remove All Erase Remove Sel. Program Verify Protect	Exit About Help General
* Sector is protected	SW Prot.	Program All Verify All



Program: tick ✓ Automatic Verify after Program

🕅 UDE Desktop - C:\TC176	6\tc1766.wsp - Controller0.Core - Command View 📃 🔲 🗙
File Edit Setup FLASH/OTP De	
📙 🎘 🖻 🛍 🗧 Mapping Driver Program Verify	/ Protection
F Automatic Chip Erase before F F F F Automatic Sector Erase be □ Simulate Random Access 1	fore Program
✓ Automatic Verify after Prog	
Safe ABM Header Handling	
Header 1 File :	
MSG: C	pened
MSG: C MSG: C	OK Cancel Help cogram FLASF ed: TriCore
For Help, press F1	Controller0.Core C:\TC1766\TC1766.cfg Controller0.Core halted by user bre

OK Exit



File – Load Program

🕅 UDE Desktop - C:\1	C1766\tc	1766.wsp - Controller0.Core - Command View
File Edit Debua Show Views	Tools Confid	Window Macro Help
□ <u>N</u> ew Workspace	CTRL+N	3 0* ·0 ·0 · · · · · · · · · · · · · · ·
≌Open <u>W</u> orkspace	CTRL+O	
'≇Sa⊻e Workspace As	CTRL+S	
[™] Save Workspace		
≌ Close Wor <u>k</u> space	ALT+F4	
Load Program		
Sconnect Target System.		
 Disconnect Target System. 		
Print Set <u>u</u> p		
Print	CTRL+P	
Recent <u>Fi</u> les		
Recent Workspaces		
		ev: TriCore JTAG/OCDS Debug Protocol, V3.8.4, ID 1 opened 1: FLASH programming for device '1,5 MByte OnChip Program FLASH server: Connection to TC1766 target monitor established: TriCore
oad program binaries and sym	bol informati	on Controller0.Core C:\TC1766\TC1766.cfg Controller0.Core halted by user bre



Open program file: Look in: select TC1766 Open program file: File name: select tc1766.elf

🕅 UDE Desktop - C:\TC1766\tc1766.wsp - Controller0.Core - Command View
File Edit Debua Show Views Tools Confia Window Macro Help
Open program file
Look in: 🖼 TC1766 🛛 🔽 ← 🖻 😤 🖩 🕶
Image: Second state st
File name: tc1766.elf Open
Files of type: Binary target files (*.out,*.elf) Cancel
MSG: Controller0.Core::UAD2CommDev: TriCore JTAG/OCDS Debug Protocol, V3.8.4, ID 1 opened MSG: Controller0.Core::UDEMemtool: FLASH programming for device '1,5 MByte OnChip Program FLASH MSG: Controller0.Core::UDEDebugServer: Connection to TC1766 target monitor established: TriCore
For Help, press F1 Controller0.Core C:\TC1766\TC1766.cfg Controller0.Core halted by user bre

Open



Click Program All

UDE Desktop - C:\TC1766\tc1766.wsp - Controller0.Core - C:\TC1766\main.c				
File Edit Debua Show Views Tools Confia Window Macro Help				
	₹} {} *{} <u></u>			
WDE - FLASH/OTP Memory Programming Tool				
Swi FLASH/OTP - Memory Device				
{ 1,5 MByte OnChip Program FLASH ▼ Enable Exit				
#0 : 0xA0000000 - 0xA001FFFF (128K)				
0xA0000000 - 0xA000014D 0xA0000150 - 0xA00007D1 0xA00002514 0 - 0xA00007D1 Remove Sel, Program Help				
// 0xA00007/D4 - 0xA0000833 //1 : 0xA0020000 0xA003FFFF (128K)				
C #2: 0xA0040000 - 0xA007FFFF (256K) #3: 0xA0080000 - 0xA00FFFF (512K)				
0xA0080000 - 0xA00802B3 #4 : 0xA0100000 - 0xA0177FFF (480K)				
0xA0100120 - 0xA010012B 0xA0102000 - 0xA0102013				
0xA0102020 - 0xA0102037 0xA0102040 - 0xA0102057				
Info Sector is protected Verify All				
MSG: Controller0.Core::UDEMemtool: FLASH programming for device '1,5 MByte OnChip Program FI				
MSG: Controller0.Core::UDEDebugServer: Connection to TC1766 target monitor established: Tric MSG: Controller0.Core::UDEDebugServer: Program with ID 0x1 - code size 2978 bytes was loaded				
Command				
For Help, press F1 Controller0.Core C:\TC1766\TC1766.cfg 0xA000(Ln 41; Controller0.Co	re ha 🎵			



UDE Desktop - C:\TC1766\tc1766.v	vsp - Controller0.Core - C:\TC17	766\main.c
File Edit Debua Show Views Tools Confia Window		
	■ * @ @ @ & @ @ @ @ @ @ @ @ @ @	
C:\TC1766\main.c		
 wR WDE - FLASH/OT Execute M Swi FLASH/OTP - Memory Device 	emtool Command	×
	H/OTP Device :	Exit
2 0xA0000000 - 0xA000000 - 0xA0000001 0xA00000150 - 0xA00007 Operation : 0xA00007D4 - 0xA00007	Chip Program FLASH	About Help
C #1: 0xA0020000 - success #2: 0xA0040000 - #3: 0xA0080000 -		General
0xA0080000 - 0xA00802 Progress : #4 : 0xA0100000 - 0xA0100120 - 0xA0101		
0xA0102000 - 0xA0102C 0xA0102020 - 0xA0102C 0xA0102040 - 0xA0102C		Program All
* Sector is protected	Exit Help	Verify All
MSG: Controller0.Core::UDEDebugServer: MSG: Controller0.Core::UDEDebugServer: MSG: Controller0.Core::PFLASH: Program	Program with ID 0x1 - code siz	
For Help, press F1	Controller0.Core C:\TC1766\TC1766.cfg	0xA0000 Ln 41: Controller0.Core ha

Exit Exit



File – Close Workspace

UDE Desktop - C:\TC1766\tc1766.wsp - Controller0.Core - C:\TC1766\main.c
File Edit Debua Show Views Tools Confia Window Macro Help
S [™] C:\TC1766\main.c
// USER CODE END
• swReturn = 0;
* switch(RESET_INDICATOR) {
Case WATCHDOG_RESET: // the last reset was a watchdog triggered // (hardware) reset
// USER CODE BEGIN (Main,4)
// USER CODE END
Case SOFTWARE_RESET: UdeSessionManager
Save changes of current workspace?
Yes No Cancel
MSG: Controller0.Core::UDEDebugServer: Connection to TC1766 target monitor established: TriCore MSG: Controller0.Core::UDEDebugServer: Program with ID 0x1 - code size 2978 bytes was loaded! MSG: Controller0.Core::PFLASH: Program sections succeeded
For Help, press F1 Controller0.Core C:\TC1766\TC1766.cfg 0xA0000(Ln 41:Controller0.Core ha

Yes

File – Exit



Execute any terminal program

(9600 Baud, 8 bit Data, no Parity-Bit, 1 Stop-Bit, Xon/Xoff Protocol):

_ 🗆 ×
•

Power-On the Board and see the result:

	_ 🗆 🗙
IC1766, Program execution out of OnChipFlash:	
1 LED IO_Port_1_Pin_0 ON 2 LED IO_Port_1_Pin_0 OFF 3 LED IO_Port_1_Pin_0 blinking	
your choice: 1 *** LED is ON ***	
TC1766, Program execution out of OnChipFlash: ====================================	
your choice: _	





Conclusion:

In this step-by-step book you have learned how to use the TC1766 Starter Kit together with the Tasking tool chain.

Now you can easily expand your "hello world" program to suit your needs!

You can connect either a part of - or your entire application to the TC1766 Starter Kit.

You are also able to benchmark any of your algorithms to find out if the selected microcontroller fulfils all the required functions within the time frame needed.

Have fun and enjoy working with the TC1766 Starter Kit!

Note:

There are step-by-step books for 8 bit microcontrollers (e.g. XC866, XC88x, and XC878), 16 bit microcontrollers (e.g. C16x, XC16x, and XE16x) and 32 bit microcontrollers (e.g. TC1796 and TC1130).

All these step-by-step books use the same microcontroller resources and the same example code.

This means: configuration steps, function names, and variable names are identical.

This should give you a good opportunity to get in touch with another Infineon microcontroller family or tool chain!

There are even more programming examples using the same style available [e.g. ADC examples, CAPCOM6 examples (e.g. BLDC-Motor, playing music), Simulator examples, C++ examples] based on these step-by-step books.



6.) Feedback (TC1766): Your opinions, suggestions and/or criticisms

Contact Details (this section may remain blank should you wish to offer feedback anonymously):

If you have any suggestions please send this sheet back to:

Email: mcdocu.comments@infineon.com FAX: +43 (0) 4242 3020 5783

Your suggestions:

Application Note

http://www.infineon.com