## How to program in FLASH OLIMEX TMS320-P28016 board

All of the TMS320-P28016 examples on the WEB can be programmed in the FLASH memory. In this order you have to replace the existing **28016\_RAM\_lnk.cmd** file from the current project with **F28016.cmd** file. In this document there is an example with Blinking\_LED project. **F28016.cmd** file for Blinking\_LED project is located in \Blinking\_LED\DSP280x\_common\cmd directory. You have to remove **28016\_RAM\_lnk.cmd** file and add **F28016.cmd** file. After build project CCS generates an output file (**Blinking\_LED.out**) in

\Blinking\_LED\DSP280x\_examples\Blinking\_LED\Debug directory.

Make sure that BOOT SELECT jumpers (GPIO34, GPIO29 and GPIO18) are placed in position "1", i.e. select boot from internal flash memory. Supply the board with 6-9VDC. Plug in TMS320-JTAG to the board JTAG connector and connect like press Alt+C. You have to see "The target is now connected" in low left corner.



Now select CCS Tools menu and select 28xx On-Chip Flash Programmer. Configure the settings like picture below and press OK

File       Open       Googh       Debadd       Good View         Image: System       UBB       UBB       UBB       UBB/TMS300_0         Image: TMS300_0       Image: System       UBB/TMS300_200_0       Image: System       None         Image: TMS300_0       Image: System       UBB/TMS300_200_0       Image: System       None         Image: TMS300_0       Image: System       UBB/TMS300_200_0       Image: System       Image: System         Image: TMS300_0       Image: System       Image: System       Image: System       Image: System         Image: TMS300_0       Image: System       Image: System       Image: System       Image: System       Image: System         Image: TMS300_0       Image: System       Image: System       Image: System       Image: System       Image: System       Image: System         Image: System<	🍪 CCStudio: Parallel Deb	oug Manager	2							×
Processor       Mode       Program       Endiances       OS         USB       USB       USB/TMS320C2800_0       USB/TMS320C2800_0 - TMS320C2800_0 - TMS320C2800_0 - TMS320C2800_0       Unknown       Litle Endian       None         IMare       CM       Edd       View       Projects       Stop-mode(	File Open Group Debug	g Options H	Help							
Name       CPU Status       Processor       Mode       Program       Endiances       OS         USB       USB/TMS3       Hated       TMS320C20       Stop-model       Unknown       Little Ender       None         USB/TMS3       Hated       TMS320C20       Stop-model       Unknown       Little Ender       None         USB/TMS3       Hated       TMS320C20       Stop-model       Unknown       Little Ender       None         File       Edit       View       Project       Debug       EL Option       Profile       Tools       DSF/BLOS       Window       Heb         Image: Status	X X A A A	Default Grou	ip 🗾	Board View	•					
Zu       File Edit Wew Project Debug GEL Option Profile Tools DSP/BLOS Window Help         Image: Section Profile Tools DSP/BLOS Win	System	800 <u>0</u>	Name USB/TMS3	CPU Status Halted	Processor TMS320C2	Mode Stop-mode[]	Program Unknown	Endianess Little Endian	None	
A       Image: Second Sec	TMS320(	🛃 /USB/TMS	5320C2800_(	) - TM5320C2	8хх - Code C	omposer Stu	dio			_ D ×
74   74   74   74   74   74   75   76   77   78   79   70   70   70   71   72   73   74   75   76   77   78   79   70   70   70   71   72   73   74   75   76   76   77   78   79   70   70   70   71   72   73   74   75   76   76   77   78   79   70   70   70   71   72   73   74   75   76   76   77   78   79   70   70   70   70   71   72   74   75   76   77   78   79   79   70   70   70   70   70   70   70   70   70   70   70   70   70   70 <td>F</td> <td>File Edit Vie</td> <td>ew Project</td> <td>Debug GEL</td> <td>Option Profile</td> <td>e Tools DSP</td> <td>/BIOS Windo</td> <td>w Help</td> <td>-</td> <td></td>	F	File Edit Vie	ew Project	Debug GEL	Option Profile	e Tools DSP	/BIOS Windo	w Help	-	
7.1   7.1		1	X @ 6	n n			<b>•</b>	6 6 % %	₩ <b>₩</b> %   ⊕	
7.1   7.1			1	~		💽 🗇 🖽	₩ 👗   🖉	9 🙊 🔴	r in the second	
7.1   7.1		Fa 60°	Ö 🖩 🛤	. 🔜 🔤	d 👳					
	7.1 Setup CCStudio v3.3 CCStudio v3.3 Blinking_LED		es   GEL files   Projects		Clock C CLKIN PLCC	sembly           70E2         EDF           70E3         1A0           70E5         6FF           70E7         020           70E8         761           70E4         1E0           70E5         1E0           70E8         1E0           70E0         1E0           70E1         1E0           70E2         1E0           70E1         8F0           Konfiguration         1K           LK (MHz):         1DIV:           KValue:         1K0UT (Mhz)	B 40800 8 2 0 F01BE 6 8 6 100 72 ▼ 6 60.0000	LIC SBF OR SB EALLOW MOVU MOVU MOVU MOVU MOVI.		

In the next window browse to C:\CCStudio\_v3.3\plugins\Flash28xx\Algorithms\28016\FlashAPIInterface2801 6V1\_00.out file and press OK

🐼 CC Studio: Parallel D	ehun Manan	er						_			
File Open Group Deb	oug Options	Help						_			
00022	🕿 Default Gr	oup 💌	Board View	-							
🖃 😻 System		Name	CPU Status	Processor	Mode	Program	Endianess	OS			
□ □ □ □ USB	2800.0	USB/TMS3	Halted	TMS320C2	Stop-mode[]	Unknown	Little Endian	None			
🏀 TMS3200	🥨/USB/TN	15320C2800_(	D - TM5320C2	8אא - Code C	omposer Stu	idio					
	File Edit V	/iew Project	Debug GEL	Option Profile	e Tools DSP	/BIOS Windo	w Help				
	11 🖻 🖉 🖢					<b>-</b>	an in in i	in 🖬 😘	<b>⊜ №</b>	6/目→泪   ●	離離し
			-		🗩 🕸 🖼	₩ 👗   🖑	b 🕸  🗰	<u>}</u>			
		n 🖩 🖽		a 👳							
	600   00										
	🕑 🔮 🗗	iles		💽 Disass	sembly			믜픠			
7.1	8°	GEL files	I	= <b>→</b> 3F	70E2 EDF	B 40900	SBF				
<u> </u>	{}+		I	3F	70E5 1A0 70E5 6FF	8	SB				
2	(4)		I	ЗF	70E6 762	2	EALLOW				
Setup CCStudio v3-3	0ª		I	3F 3F	70E7 020 70E8 761	O FOIBE	MOVB				
				ЗF	70EA 1E0	6	MOVL				
	-0		I	3F	70EB 1E0	8	MOVL				
	{ <del>+</del> }			3F	70EC IEO 70ED 8EO	6 00800	MOVL MOVL	-			
CCStudio V3.3	× I										
	28		Flash	Programmer	Settings						
	28			elect DSP Devi	ce to Program-	- Optic	ons			ок	
Blinkina LED				F28016 💌			Load Symbols			Cancel	
2_							Display Tuolups Display Diagnos	tics	_		
							Gave Clock Set	tings		Help	
	。 B		Sele	ect version of Fl	lash API. Interfa	ce file:					
		<b>4</b>	ludi	udio v3 3\plugips\Elash28v\Algorithms\28016\Elash4Plipterface28016V1_00.gut						Rome	
				s_+o.o spiagins	a isonzonn Migi		a idonesi milene			//04/8C	
	🖹 💁 🗛	ED					The devi	ce is unlocked.			

Now browse to

Blinking\_LED\DSP280x\_examples\Blinking\_LED\Debug\Blinking\_LED.out file and press Execute Operation. When the program and verify operations are finished – close On-Chip Flash Programmer window and you will have Blinking LED project in flash memory.

🎊 CCStudi	o: Para	illel Debug M	anage	r						_ [	×	
File Open Group Debug Options Help												
P     P <th></th>												
🖃 🌾 Sys	tem	r		Name	CPU Status	Processor	Mode	Program	Endianess	OS		
7.1 7.1 Setup CCStudio v3. CCStudio v3. Blinking_LED.		SB/TMS3220 Edit View F Files Files GGL Proj HALTED		ip Flash Prog ock Configurati CCLK (Mh2): KINDIV: LCR Value: SCLKOUT (MH de Security Pa de Secur	prammer 20 /2 6 12 6 12 6 12 6 12 6 12 12 12 12 12 12 12 12 12 12	Erase Sect Sector Sector Sector Sector Please sp Blinking Erase Progra Progra Progra Verify Flash Flash OTP \ Coad I Execu	or Selection A: (3F6000-3 B: (3F4000-3 C: (3F0000-3 D: (3EC000- E: (3E8000-3 E: (3E800-3 E: (3	3F7FFF) [ 3F5FFF) [ 3F3FFF] [ 3EBFFF] [ 5EBFFF] [	Sector F: (3) Sector G: (3) Sector H: (3) Sector H: (3) Sector J: (3) m/Verify: inking_LED\De oletion Recovery quency Test ster: GPAMu GPIO0 (A) GPIO0 (A) GPIO0 (A) GPIO0 (A) Flash: GPIAsh: GPIAsh:	E4000-3E7FFF) 20000-3E3FFF) 20000-3D3FFFF) 20000-3D3FFFF) 20000-3D3FFFF) 8 8 8 8 8 8 8 9 1 1 1 1 1 1 1 1 1 1 1 1 1		

You can debug source code in disassembly window if you **load program** (Ctrl+L) through File menu>Load Program and browse to the same Blinking\_LED.out file from Plinking\_LED\DSP280v\_evemples\Plinking\_LED\Debug directory

 $Blinking\_LED \ DSP280x\_examples \ Blinking\_LED \ Debug\ directory.$ 

On the our WEB we have a compiled Blinking\_LED\_FLASH project.