OmniPreSense

AN-013 OPS241 Code Update

From time to time, OmniPreSense provides code updates with new features and/or fixes for its radar sensors. The embedded code in the OPS241 short range radar sensor can be easily updated to take advantage of these enhancements. This application note describes how to update the code on the OPS241 radar sensors.

Update Tools

To update the code on the OPS241 radar sensor the user will need a JTAG programmer and a PC based code flashing tool. An example of a low cost JTAG programmer is the <u>miniWiggler</u> (Figure 1) available from Infineon. Other models are available from <u>Segger</u>.



Figure 1. miniWiggler JTAG Programmer

The code flashing tool used by OmniPreSense is Memtool (Figure 2) also provided by Infineon. This free tool is available <u>here</u>.

	PFLASH	I: 256 kByte OnC	hip Program FLAS	H (not ready)	•	🔽 Enable
Open File Select All Add Sel >> Save As Read Edit	Index 0 1 2 3 4 5 5 6 7 8	Start 0x0C00000 0x0C004000 0x0C00000 0x0C010000 0x0C010000 0x0C014000 0x0C018000 0x0C018000 0x0C018000	End 0x0C003FFF 0x0C003FFF 0x0C008FFF 0x0C013FFF 0x0C013FFF 0x0C013FFF 0x0C018FFF 0x0C018FFF	5ize 16K 16K 16K 16K 16K 16K 16K 16K 16K 128K	Erase Program Verify SW Protect HW Protect, Info State	Program all Verify all
	Remo	ve All Remov	re Sel.		Setup	

Figure 2. Memtool Programming Tool

Code Updating

To update the code in the OPS241, follow the step by step instructions which follow. You should have a JTAG programming tool like the miniWiggler or Segger noted above.

Step 1. Download and install the Memtool programming tool from the Infineon website. Follow the installation instructions that come with the download.

Step 2. Connect the JTAG programming tool connector to the JTAG connector on the OPS241 (J6) located in near the middle of the board (Figure 3). The connector is keyed, so it can only connect in one direction.

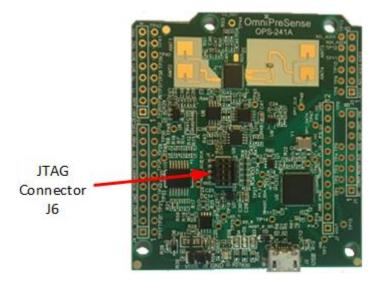


Figure 3. JTAG Connector J6

Step 3. Plug in the USB connector of the JTAG programmer to a USB port on the PC. Plug in a USB micro cable into the OPS241 and the other end into another USB port on the PC (Figure 4). This provides power to the OPS241 during the program update.

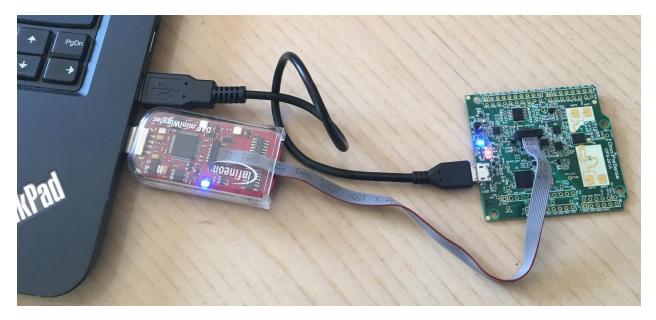


Figure 4. USB and JTAG Connections to PC

Step 4. Start Memtool on the PC to get a window similar to that shown in Figure 2. Press the Connect button. A message will appear to the right of the Connect button indicating the connection is in progress. If successful, the message will change to "Ready for Memtool Command" (Figure 5).

Infineon - Memtool on Infineon XMC File Target Device Log Help File:	4200 Hexagon Kit XN	C4200 (DAS) FLASH/DTP - Memory Device PFLASH: 256 kByte OnChip Program FLASH	- C X
	Open File Select All Add Sel. >> Save As Read Edit	Index Start End Size 0 0x0C000000 0x0C003FFF 16K 1 0x0C000000 0x0C007FFF 16K 2 0x0C000000 0x0C007FFF 16K 3 0x0C000000 0x0C007FFF 16K 4 0x0C010000 0x0C017FFF 16K 5 0x0C014000 0x0C017FFF 16K 6 0x0C018000 0x0C017FFF 16K 7 0x0C012000 0x0C01FFFF 16K 8 0x0C020000 0x0C01FFFF 16K 8 0x0C020000 0x0C03FFFF 128K	Erase Program Program all Verify Verify all SW Protect HW Protect Info State Setup
infineon	Tool Disconnect	Ready for Memtool Command	Help Exit

Figure 5. Memtool Connected State Window

Next, select Open File in the middle left of the window, browse to the location of the hex file to update the OPS241 with (Figure 6) and press Open. Contact OmniPreSense <u>customer service</u> to obtain the latest code version.

Grade City City <thcity< th=""> City City <th< th=""><th>FLASH/0TP - Memory Device PFLASH: 256 kByte OnChip Program FLASH Index Start End Size 0 0x0C000000 0x0C003FFF 16K 1 0x0C000000 0x0C003FFF 16K 2 0x0C000000 0x0C000FFF 16K 3 0x0C000000 0x0C000FFF 16K 4 0x0C000000 0x0C001FFF 16K 5 0x0C010000 0x0C013FFF 16K 6 0x0C018000 0x0C01FFFF 16K 8 0x0C020000 0x0C03FFFF 128K</th><th>▼ Enable Erase Program Program Verify Verify Verify all SW Protect HW Protect Info State</th></th<></thcity<>	FLASH/0TP - Memory Device PFLASH: 256 kByte OnChip Program FLASH Index Start End Size 0 0x0C000000 0x0C003FFF 16K 1 0x0C000000 0x0C003FFF 16K 2 0x0C000000 0x0C000FFF 16K 3 0x0C000000 0x0C000FFF 16K 4 0x0C000000 0x0C001FFF 16K 5 0x0C010000 0x0C013FFF 16K 6 0x0C018000 0x0C01FFFF 16K 8 0x0C020000 0x0C03FFFF 128K	▼ Enable Erase Program Program Verify Verify Verify all SW Protect HW Protect Info State
Cinfineon Tool Disconnect	Remove All Remove Sel.	Setup

Figure 6. Hex File Selection

Step 5. Several address files should appear in the window on the left. Press the Select All button in the middle left of the window to select all the files to program and then press Add Set>> (Figure 1Figure 7).

C:\Workspaces\DAVE-4.3-64Bit\WS_20	16_09_02\0PS24	SH: 256 kByte OnC	hip Program FLAS	Ή	•	🔽 Enable
0x0C000000 - 0x0C000293 0x0C020000 - 0x0C03816E 0x0C038170 - 0x0C03916B	Open File Inde Unselect All 1 Add Sel. >> 3 Save As 6 Read 7 E dit 8	 Start 0x0C000000 0x0C004000 0x0C006000 0x0C000000 0x0C010000 0x0C010000 0x0C0140000 0x0C018000 0x0C0120000 0x0C0120000 0x0C0120000 	End 0x0C003FFF 0x0C003FFF 0x0C008FFF 0x0C013FFF 0x0C013FFF 0x0C013FFF 0x0C015FFF 0x0C015FFF	Size 16K 16K 16K 16K 16K 16K 16K 16K 128K	Erase Program Verify SW Protect HW Protect Info State	Program al Verify all
infineon	- Tool	Nove All Remov			Setup	Exit

Figure 7. Select All Files and Add Sel>> Window

Step 6. Pressing Add Sel>> will add the files to the window on the right side. The Program all button on the far right will now be available to press (Figure 8).

Infineon - Memtool on Infineon XMC42 File Target Device Log Help File : C:\Workspaces\DAVE-4.3-64Bit\WS_2010 0x0C000000 - 0x0C000293 0x0C0020000 - 0x0C003816E 0x0C038170 - 0x0C03916B	C09_02\0PS24 FLA Open File Unselect All Add Set. >> Save As Read Edit	(DAS) SH/OTP - Memory Devic FLASH: 256 kByte OnCh Index Start 0 0x0C000000 1 0x0C000000 1 0x0C000000 1 0x0C000000 2 0x0C000000 3 0x0C000000 3 0x0C000000 4 0x0C010000 5 0x0C014000 6 0x0C014000 6 0x0C014000 8 0x0C012000 8 0x0C012000 8 0x0C012000 8 0x0C020000 8 0x0C020000 9 0x0C02000 9 0x0C0200 9 0x0C02000 9 0x0C0200 9	End 0x0C003FFF 0x0C000233 0x0C007FFF 0x0C00FFFF 0x0C03FFF 0x0C013FFF 0x0C013FFF 0x0C013FFF 0x0C03FFFF 0x0C03FFFF 0x0C03FFFF	5ize 16K 16K 16K 16K 16K 16K 16K 16K 16K 128K	▼ Erase Program Verify SW Protect HW Protect Info State Setup	 ✓ Enable Program all Verify all
infineon	Tool Disconnect Read	y for Memtool Command			Help	Exit

Figure 8. Files Ready to Program

Step 7. Press the Program all button and the programming process will start. It will take 3-5 seconds to flash the new files into the OPS241. A progress window will appear as shown in Figure 9. Upon completion the window will stay present but in the Result box it will say "success" (Figure 10). Press the Exit button to exit the window. The board is now successfully reprogrammed.

9:	Execute Memtool Command			
:\Workspaces\DAVE-4.3-64Bit\WS_201 bx0C000000 - 0x0C000293 bx0C020000 - 0x0C03815E bx0C038170 - 0x0C03915E	6_09_01 Current FLASH/DTP Device : Dpt PFLASH: 256 kByte OnChip Program FLASH Unt Operation : Adv Erase Sector 8 Sar Result : R	Size 16K 16K 16K 16K 16K 16K 16K 16K 16K 128K	Frase Program Verify SW Protect HW Protect Info State Setup	✓ Enable Program all Verify all
infineon	Tool Start Cancel Help Disconnect Ready for Memtool Command		Help	Exit

Figure 9. Programming Board in Process

C:\Workspaces\DAVE-4.3-64Bit\WS_2016_09_0 0x0C000000 - 0x0C000293 0x0C020000 - 0x0C03816E 0x0C038170 - 0x0C03916B Uns Ada Sar R	Current FLASH/OTP Device : PFLASH: 256 kByte OnChip Program FLASH Operation : Verify 0C03916Ch - 0C0391FFh Result :	Size 16K 16K 16K 16K 16K 16K 16K	▼ Erase Program Verify SW Protect	✓ Enable Program all Verify all
0x0C020000 - 0x0C03816E 0x0C038170 - 0x0C03916B Unx Adv	Operation : Verify 0C03916Ch - 0C0391FFh	16K 16K 16K 16K 16K 16K	Program Verify	
Add	Verify 0C03916Ch - 0C0391FFh	16K 16K 16K	Verify	
Sar B	j :	16K	SW Protect	
В	Hosak.			
	success	16K 16K	HW Protect	
E	Progress :	128K	Info	
			State	
	Start Exit Help		Setup	
infineon		<u> </u>		

Figure 10. Completed Programming

Step 8. Once the board is reprogrammed it's ready to use. The Memtool will leave the board in a reset state. Unplug the board from the USB port and disconnect the JTAG connector on J6.

You can check the programming was successful by plugging the board back into the USB port on the PC and using <u>Tera Term</u> to validate the new code is programmed and runs. Start Tera Term and it will automatically detect which port the board is connected to. Select the Serial button with the proper port selection. You should see speed data (m/s) start to stream from the board while waving your hand above the board. Press ?? to report the board information and note the Version number is correct for the expected code which has been programmed (Figure 11).



Figure 11. Programmed Board Validation

Additional Notes

There are other tools which may be used for programming boards. Besides the miniWiggler, <u>Segger</u> has many programmers which can also be used. Infineon has also released a new programming tool called <u>XMC Flasher</u>. This tool works with Segger programmers but does not look to work with the miniWiggler.

Revision History

Version	Date	Description
А	Nov. 13, 2017	Initial release.