

# **Smart Socket**

# Preliminary User Guide

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## 1. Introduction

This document describes Smart Sockets, the next generation programming solution, from Lattice Semiconductor. Smart Sockets replace the legacy Lattice Model 300 and its associated Socket Adapters. Smart Sockets use the same JTAG-based Lattice Diamond<sup>®</sup> Programmer programming software that is used with Lattice Semiconductor's popular evaluation and customer boards. Standard ESD environment and procedures should be followed when working with loose devices and the Smart Socket.

## 2. Features

Each Smart Socket board is unique for a device family and package. Smart Socket boards have common features such as:

- Powered over simple USB cable
- Power switch to remove power from the socket
- Integrated FTDI USB interface to work directly with Lattice Programming tools
- Power indicator LEDs
- Convenient test points

## 3. Block Diagram

Figure 3.1 shows the high level blocks of a Smart Socket board. The four major blocks on the board are:

- USB connector
- USB-to-SPI/JTAG communication bridge
- Board power regulator
- Lattice Semiconductor Socket (Family specific)

A switch controls power to the socket. Three separate LEDs indicate USB power, Socket Power and Programming Done (Programming Done support varies by device family).



\*Note: Programming Done support depends on the device family.

### Figure 3.1. Smart Socket Programming Board Block Diagram



## 4. Board Specifications

The outline dimension is the same for all Smart Socket boards. The dimensions of the socket vary based on target device family and package.

Board dimensions:

- Width: 4 inch
- Length: 6 inch
- Height: < 2 inch

**Electrical Specification:** 

• +5 V @ 500 mA or less (provided by USB cable)

The complete list of sockets is available at: http://www.latticesemi.com/sockets



## 5. Software Requirements

Smart Sockets are supported by Lattice Diamond<sup>®</sup> Programmer. The latest version of the Lattice Diamond Programmer can be downloaded at:

http://www.latticesemi.com/en/Products/DesignSoftwareAndIP/FPGAandLDS/LatticeDiamond.aspx

The Smart Socket works with the Lattice Diamond Programmer using only a USB cable. Connect the cable from the Smart Socket to a PC, and use the cable search feature in Lattice Diamond Programmer to establish the programming link. The steps to program a device are described below.

### 5.1. Generic Programming

1. Launch the Lattice Diamond Programmer software. The Diamond Programmer starting page appears as shown in Figure 5.1.

😔 Diamond Programmer - Getting Started	? X
Select an Action	
Oreate a new project from a JTAG scan	
Cable: HW-USBN-2B (FTDI)   Port: FTUSB-0  Detect Cable	
Create a new blank project	
Open an existing programmer project	
C:/Users/rkoche/Desktop/Apps_2/Smart_Socket_UG/ECP5/Smart_socket_ECP5/ecp5um_85f_es_test_SS/smart_socket_ECP5_test_diamond_prog.xc	f 🔻
OK	Cancel

Figure 5.1. Getting Started

2. Click **OK.** The Diamond Programmer automatically starts scanning. The scanning page appears as shown in Figure 5.2.

Diamond Programmer		_ 🗆 X
File Edit View Design Help 한편님 응유유유 모양 월		
	Scarning	Coble Settings  Coble Settings  Coble Settings  Coble Settings  Coble Settings  Coble Settings  Countom parts  Programming Speed Settings  Was cautom Clock Divider  TCK Divider Setting (0-10x) 1 \$  VO Settings  Uo setting S  Uo settings  Uo setting S  Uo
Output	lufo*	8 ×
Lattoc VM Drivers detacted (HW-DUI-3C (Parallel), HW-USBR-28 (FTDI)) Programmer device database located atabase located atabas	UD 2342002 INFO - Scanning US82 Port F	Message TUS8-0
Output T/J Consile Programmer Loading Desize Database	Error Warning Info*	

Figure 5.2. Scanning



When the device scanning is completed, the Diamond Programmer tool shows the device present in socket in the **Device** tab. If the Diamond Programmer is unable to identify the device in socket, the device family name will be highlighted with a yellow background in the **Device** tab as shown in Figure 5.3. Some device families may not support the scan operation. For details, see the Specific Software Requirements for Certain Device Families section on page 10.

🕗 Diamo	nd Progra	ammer - Untitled *			
File Edi	t View	Design Help			
🖰 🛍 🖗	-		5		
Enable	Status	Device Family	Device	Operation	File Name
1 🔽		ECP5UM	LFE5UM-85F	Fast Program	
Output					Info*
Lattice VM Programme INFO - Sca	Drivers det er device d nning USB2	tected (HW-DLN-3C (Paralle atabase loaded 2 Port FTUS8-0	el), HW-USBN-2B (FTDI)	)	3 23
INFO - Sca WARNING	n complete · Cannot id	ed successfully. entify detected device on re	ow 1. Please manually s	elect the correct device.	3 23
Output	Tcl Cons	sole			Error
Ready					

Figure 5.3. Unable to Identify Device

In such case, click in the yellow highlighted area and select the appropriate device by matching the device name on the package with the dropdown list in the **Device** tab. Select the correct device on the dropdown list, and the yellow background highlighting will disappear as shown in Figure 5.4.

😒 Diamond Programmer - Untitled *										
File Edit Vi	File Edit View Design Help									
i 🖺 🖻 🗐	:::::::::::::::::::::::::::::::::::::::									
Enable Sta	us Device Family	Device	Operation	File Name						
1 🔽	ECP5UM_ENG	LFE5UM-85F-ES	Fast Program							

Figure 5.4. Identifying Correct Device

3. Next step is to verify that the desired **Operation** is specified, and update if necessary. To update the operation, select the device row so that it is highlighted in blue as shown in Figure 5.5. On the menu bar, click **Edit**, and on the dropdown menu click **Device Properties** as shown in Figure 5.5.



Diamond Programmer - Untitled *												
File	Edit View Design Help											
1 😷	ß	Сору	Ctrl+C									
E	ĥ	Paste	Ctrl+V		Device	Operation	File Name					
1 🗸	-	Add Device			LFE5UM-85F-ES	Fast Program						
		Remove Device			I							
	2	Device Properties										
		Edit I/O State										
		Custom Devices										
		Settings										

Figure 5.5. Access Device Properties through Edit

- 4. Select the appropriate programming file by clicking the button in the **Programming Options** section as shown in Figure 5.6.
- 5. Click OK.

ECP5UM_ENG - LFE5UM-85	F-ES - Device Properties
General Device Information	
Device Operation	
Access mode:	JTAG 1532 Mode 🔻
Operation:	Fast Program 👻
Programming Options	
Programming file: cp5um_8	35f_es_test_SS_ecp5um_85f_es_test_SS.bit
Device Options	
Reinitialize part on progra	m error
	]
	OK Cancel

Figure 5.6. Programming Options

6. The selected file is shown in the File Name tab of Diamond Programmer, see Figure 5.7.

ſ	🔛 Diamond Programmer - Untitled *									
	<u>F</u> ile <u>E</u> dit	<u>V</u> iew	<u>D</u> esign <u>H</u> elp							
	i 😷 📸 🖶		😂 😂 🗭 🚱 🔛 I							
	Enable	Status	Device Family	Device	Operation	File Name	File Date/Time	Checksum	USERCODE	
	1		ECP5UM_ENG	LFE5UM-85F-ES	Fast Program	3/ecp5um_85f_es_test_SS_ecp5um_85f_es_test_SS.bit	8/16 12:17:51	N/A	0x0000000	

### Figure 5.7. Bit File Selection

- 7. Programming the selected file in the device can be done in two ways:
  - Click the **Program** icon shown in Figure 5.8.

1	Diamond Programmer - Untitled *										
	<u>F</u> ile <u>E</u> dit	<u>V</u> iew	<u>D</u> esign <u>H</u> elp								
	안 🖻 🗄		i 🕼 😂 🗳 i 🚱 🌆 i								
	Enable	Status	Device Family Progra	am Device	Operation	File Name	File Date/Time	Checksum	USERCODE		
	1		ECP5UM_ENG	LFE5UM-85F-ES	Fast Program	5/ecp5um_85f_es_test_SS_ecp5um_85f_es_test_SS.bit	8/16 12:17:51	N/A	0x00000000		

### Figure 5.8. Program Icon



• On the menu bar, click Design, and on the dropdown menu, click Program as shown in Figure 5.9.

Diamond Programmer - Untitled *											
<u>F</u> ile <u>E</u> dit <u>V</u> i	Eile Edit View Design Help										
i 😷 📸 🗟   i	월 🖻 🖥 😸 😂 JTAG <u>S</u> can										
Enable Sta	atus 🧯	<u>Check XCF Project</u>	Device	Operation	File Name						
1	1	<u>P</u> rogram	M-85F-ES	Fast Program	3/ecp5um_85f_es_test_SS_ecp5um_85f_es_test_SS.bit						
	<b>1</b> 0	Log Clear L <u>og</u> File									
		Utilities •									
		BSCAN Configuration									

Figure 5.9. Design Menu

Figure 5.10 shows that the programming of device is in progress.

😔 Diamond Programm	ner - Untitled *							
<u>F</u> ile <u>E</u> dit <u>V</u> iew <u>D</u> e	esign <u>H</u> elp							
i 🖀 📷 🔚 i 😫 i 💝	🖨 🧭   🐼   🎥   🔤							
Enable Status	Enable Status Device Family Device Operation			F	File Name	File Date/Time	Checksum	USERCODE
1 🗹 ECP	P5UM_ENG	LFE5UM-85F-ES	Fast Program	3/ecp5um_85f_es_test_S	S_ecp5um_85f_es_test_SS.bit	8/16 12:17:51	N/A	0x00000000
Output				Programmi	ng XCF			

Figure 5.10. Programming in Progress

8. When the programming of the device is completed, the **Status** option changes to *PASS* and *Operation Successful* message appears in the **Output** console as shown in Figure 5.11. On the board, the green *Done* LED is lit when the device is successfully programmed (*Done* LED behavior is device dependent, see below for details).

Diamond Progr	ammer - Untitled *										
Eile Edit View	Design Help	ī									
Enable Status	Device Family	Device	Operation	F	ile Nar	ne	File Date/Time	Checksum	USERCODE		
I PASS	ECP5UM_ENG	LFESUM-85F-ES	Fast Program	i/ecp5um_85(_ea_test_55	5_ecp5	um_85(_es_test_	,55.bt 😡8/16 12:17:51	N/A	Dx0000000	Cable and I/O Settings	Cable Settings
Output					Info*						đ ×
INFO - Check configu	ration setup: Successful.			*		ID	Message				
INFO - Device1 LEES	M-85E-ES: Fast Program				9	2342002	INFO - Scanning USB2	Port FTUSB-	0		E
Bill Constant Des	an the second				9	2342003	INFO - Scan completee	d successfully	c.		
BIPO - Operation John, in errors. BIPO - Elapsed time: 00 min : 03 sec BIPO - Operation: successful.			=	٩	85021074	INFO - Check configuration setup: Start.					
			*	30	85021076	INFO - JTAG Chain Verification. No Errors.				-	
Output Tcl Con	sole				Erre	or Warning*	Info*				

Figure 5.11. Successful Programming



### 5.2. Specific Software Requirements for Certain Device Families

### 5.2.1. MachXO3 Programming

The programming of Mach XO3 device family follows steps similar to the process described in Generic Programming section. *Done* is not a dedicated output in the MachXO3 family. *Done* LED indication is not supported.

### 5.2.2. ECP5 Family Programming

The programming of ECP5 device family follows steps similar to the process described in Generic Programming section. When the programming of these devices is completed successfully, the *Done* LED is lit.

### 5.2.3. L-ASC10 Programming

Specific steps to program the ASC devices:

1. Launch the Lattice Diamond Programmer software.

The Diamond Programmer automatically starts scanning the device and detects XO2 device as shown in Figure 5.12.

😳 Diamono	d Programm	ner - Untitled *									- 🗆 X
File Edit	View De	sign Help									
268		<u>କଟା କେ ଓ</u> 🔤	1	2 39 4 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		255 N	110000000000000			1	12
Enable	Status	Device Family	Device	Operation	File Na	me	File Date/Time	Checksum	USERCODE		Cable Settings
1 🔽	Ma	ichXO2	LCMXO2-7000HC	FLASH Erase, Program, Verify							
											Detect Cable
											Cable: HW-US8N-28 (FTDI)
										15	Port: FTUS8-0 •
										etta	Custom port:
										So	Programming Speed Settings
										26	Use default Clock Divider
										able	🕐 Use custom Clock Divider
											Contraction of the second second
											TCK Divider Setting (0-10x)
											I/O Settings
											Use default 1/O settings
											Una custam UO sattings     *
Output					Info*						e ×
Lattice VM Dr	rivers detecte	d (HW-DLN-3C (Parallel	), HW-USBN-28 (FTDI))			ID			Mes	sage	
INFO - Scann	ing USB2 Por	t FTUSB-0			9	2342002	INFO - Scanning USB2	Port FTUSB-0	)		
WARNING - C	completed su Cannot identif	ccessfully. y detected device on ro	w 1. Please manually selec	t the correct device.	9	2342003	INFO - Scan completed	successfully			
Output	Tcl Console				Err	or Warning	* Info*				
Ready											ti.

Figure 5.12. ASC Socket – Scanned Device XO2

2. Double click in the box below **Operation** tab, see Figure 5.13.

The dialog box appears as shown in Figure 5.14.

	Diamond Programmer - Untitled *										
F	ile Edit	View	Design Help								
	🎦 🖆 🕞		🥵 😳 🧭   🌇   🌆   🍱								
	Enable	Status	Device Family	Device	Operation	File Name					
1	<b>√</b>		MachXO2	LCMXO2-7000HC	FLASH Erase,Program,Verify						

Figure 5.13. ASC Socket – Operation Tab



3. In Access Mode dropdown list, select *PTM programming*. When this access mode is selected the **Operation** tab changes to **PTM Bypass**.

MachXO2 - LCMXO2-700	0HC - Device Properties								
General Device Informat	ion								
Device Operation									
Access mode:	Flash Programming Mode								
Operation:	Advanced Security Keys Programming Advanced Security File Programming								
Programming Options	SPI Flash Programming Slave SPI Interface Programming								
Programming file:	I2C Interface Programming JTAGI2C Interface Programming Advanced Flash Programming (FPGA Loader)								
Device Options	PTM Programming PTM Background Programming								
Reinitialize part on program error									
	OK Cancel								

Figure 5.14. ASC Socket – Device Properties

4. Add an external ASC device, by clicking the to button as shown in Figure 5.15. The dialog box appears as shown in Figure 5.16 on the next page.

MachXO2 - LCMXO2-7000HC - Device Properties	9	X					
General Device Information							
Device Operation							
Access mode: PTM Programming	PTM Programming						
Operation: PTM Bypass		•					
External ASC Options							
		Ξ					
+ Add external ASC device							
		-					
ОК	Car	ncel					

Figure 5.15. ASC Socket – Add External ASC Device



MachXO2 - LCMXO2-7000HC - Device Properties	2	X
General Device Information		
Device Operation		
Access mode: PTM Programming		-
Operation: PTM Bypass		•
External ASC Options		
External ASC Device #1		•
File: I2C Slave Address:		
Operation: ASC Erase, Program, Verify   1100000		
		Ξ
+ Add external ASC device		*
•	4	
ОК	Car	icel

Figure 5.16. ASC Socket – ASC File Load Menu

- 5. Select the programming file by clicking the button. A dialog box appears where you can select the relevant \*ASCx.hex file to program in the device.
- 6. From the **Operation** dropdown list, select *ASC Erase, Program, Verify*.



MachXO2 - LCMXO2-7000HC - Device Properties
General Device Information
Device Operation
Access mode: PTM Programming
Operation: PTM Bypass
External ASC Options
External ASC Device #1
File: SPI_Interface_Board_ASC0.hex I2C Slave Address:
Operation: ASC Erase,Program,Verify   1100000
Ē
+ Add external ASC device
UK Cancer

Figure 5.17. ASC Socket – Operation Menu

The warning shown in Figure 5.18 may appear if the selected external ASC device and the File targeting device do not match.



Figure 5.18. Warning

7. Click **OK**. The same warning appears in the output console window as shown Figure 5.19.



Diamond	Progr	ammer - Untitled *									
File Edit	View	Design Help									
2008	- 44 50									Nr. 30	
Enable	status	Device Family	Device	Operation	File Na	sme	File Date/Time	Checksum	USERCODE		- 11 C M
1		MachXO2	LCMXO2-7000HC	PTM Bypass						Cable and VO Settings	Cable settings
Output					Info						e ×
Lattice VM Driv Programmer d	ers de evice d	tected (HW-DLN-3C (Parallel), database loaded	HW-USBN-28 (FTDI))			ID			Mes	sage	
INFO - Scannie INFO - Scan o	g USB molet	2 Port FTUSB-0 ed successfully.			0	2342002	INFO - Scanning USB2	Port FTUSB-	)		
WARNING - Co WARNING - W External ASC o File targetting These do not o	nnot io sming: levice : device natch	dentify detected device on row File C:/USERS/RKOCHE/DES/ selected: 0. ± 2.	1. Please manually sele CTOP/APPS_2/SMART_St	et the correct device. DCKET_UC/ASC_X02/HEX_FILE_FOR_PROGRAMMING/FL_SPL_T	3	2342003	INFO - Scan completed	l successfully			
d Cutture 1	ri con	rola	III		En	Marning*	Info T				
output	o con	owner 1			En	warning	nuo				

Figure 5.19. ASC Socket – Warning for XO2

In the **Operation** tab *PTM Bypass* and the **File Name** tab are greyed out (not allowing you to add a new file) as shown in Figure 5.20.

	Diamond Programmer - Untitled *										
F	ile Edit View Design Help										
	2 🖻 🔚 🛿 😂 😂 🕸 🕼 🕼 🖳 🛄 🛛										
	Enable	Status	Device Family	Device	Operation	File Name					
1	<b>V</b>		MachXO2	LCMXO2-7000HC	PTM Bypass						

Figure 5.20. ASC Socket – Ready to Program Step

8. Program the ASC device through XO2 device on the Smart Socket board by clicking the **Program** icon in Figure 5.21.

2	Diamond Programmer - Untitled *									
F	ile Edit	View	Design Help							
*****	🎦 🖆 🔒		🤪 😂 🥔   🏡   🌉							
	Enable	Status	Device Fami	Device	Operation	File Name				
1	<b>√</b>		MachXO2	LCMXO2-7000HC	PTM Bypass					
						······································				

### Figure 5.21. ASC Socket – Programming

9. When the programming of the device is completed, the Status option changes to PASS and Operation Successful message appears in the Output console as shown in Figure 5.22. During the programming activity the MXO2\_SDA and MXO2\_SCL LED light are blinking on the board showing communication between the XO2 and ASC device. Done is not a dedicated output in the MachXO2 family. Done LED indication is not supported.



Diamond Programmer -	Untitled *								- O -X-
File Edit View Design	Help								
208 8 8 8 8	0 G 😫 🔛							1. 10	
Enable Status	Device Family Device	Operation	File Na	me	File Date/Time	Checksum	USERCODE		Cable Cattings
1 🗹 🥸 MachXi	22 LCMXO2-7000HC	PTM Bypass						Cable and I/O Settings	Detect Cable Cable Cable: INV-USBN-28 (FTD) FOU: Custom port: Custom port: Dise default Clock Divider Ouse custom Clock Divider TCK Divider Setting (0-10x) 1 VO Settings Output: Settings Output: Divide Setting Sett
Output			Info*						8 ×
			1	ID			Messa	ge	*
INFO - External ASC Operation	Done, No errors.		30	2342002	INFO - Scanning USB2	Port FTUSB-0	)	7.0	E
INFO - Operation Done, No erro	ors.		1	2342003	INFO - Scan completed	successfully			
INFO - Elapsed time: 00 min :	32 sec			85021074	INFO - Check configura	tion setup: S	tart.		
INFO - Operation: successful,			<b>*</b>		12.660 (24.22.22.22.22.22.2				
	10		100	85021076	INFO - JTAG Chain Verif	ication. No B	Errors.		
Output Tel Console			Err	or Warning*	Info*				

Figure 5.22. ASC Socket – Programming Completed

### 5.2.4. iCE Family Programming

1. Launch the Lattice Diamond Programmer software.

The scanning of the device fails as the Scan operation is supported over JTAG interface only, and the iCE family of devices uses SPI interface for programming. See Figure 5.23.

Diamond Programmer *								- 0 <b>- X</b> -
File Edit View Design Help	<b>7</b> 8 A							
Enable Status Device Family 1 2 Generic JTAG Device	Device JTAG-NOP By	Operation pass	File Name	File Date/Time	Checksum	USERCODE	Cable and I/O Settings	Coble Settings Detect Coble Coble First=0 Coble First=0 Forgramming Speed Settings Use default Clock Divider Use custom C
Output			Info*					ē ×
Lattice VM Drivers detected (HVP-DUP-3C (Prael) Programmer device database looded 3PFO - Scanning USS2 Perc FTUSB 0 ERROR - Fallet as scan baark. ERROR - Scan Pailed - Creating Blank Programm	ID 3 2342002 INF	ID     Message       2242002     INFO - Scanning USB2 Port FTUSB-0						
Output Tcl Console Ready			Error* Warning 1	nfo*				

Figure 5.23. iCE Family – Scanning Failed

Manually select the device by choosing the following options as shown in Figure 5.24.
 Device Family: iCE5LP (select the appropriate device from the dropdown list)
 Device: iCE5LP1K (choose the size of the device based on the device present in the socket)



😒 D	)iamon	d Progra	ammer *			
File	Edit	View	Design Help			
1 😷	🖻 🖯	00	🤪 😂 🧭   🐼   🍣	LOG		
E	Enable	Status	Device Family		Device	Operation
1	/		iCE5LP	-	iCE5LP1K	Fast Program
			ECP5UM ECP5U ECP5U_ENG ECP5U_ENG MachXO3L MachXO3LF iCE40 iCE40_ENG iCE40LM ICE5LP	•		

Figure 5.24. iCE Family – Device Family List

3. Select the programming file that you want to program in the iCE device by double clicking the button below the **File Name** tab as shown in Figure 5.25.

	Diamon	d Progra	ammer *				
F	ile Edit	View	Design Help				
****	🎦 🖆 🔚		🤪 😂 🧭   🌇   🎥   🔤				
	Enable	Status	Device Family	Device	Operation	File Name	File Date/Time
1	<b>V</b>		iCE5LP	iCE5LP1K	Fast Program	ile_for_testing_Smart_socket/SS_test_prog_bitmap.bin	2/16 17:29:08

Figure 5.25. iCE Family – Select the Programming File

4. Click the **Program** icon to program the device as shown in Figure 5.26.

×.	🛃 Diamon	d Progra	ammer *						
ſ	File Edit	View	Design Help						
	안 🖻 🗄		🤪 😂 🧭   🐼   🌆						
ſ	Enable	Status	Device Family Program	Device	Operation	File Name	File Date/Time	Checksum	USERCODE
ſ	1 🗸		iCE5LP	iCE5LP1K	Fast Program	ile_for_testing_Smart_socket/SS_test_prog_bitmap.bin	2/16 17:29:08		

Figure 5.26. iCE Family – Program Icon

5. When the programming of the device is completed, the **Status** option changes to *PASS* and *Operation Successful* message appears in the **Output** console as shown in Figure 5.27.



Diamond Programm	er*											x
File Edit View Der	sign Help G 🕼 G 🌆 🏧	ŧ.										
Enoble Status PASS iCES	Device Family	Device iCESLP1K	Operation Fast Program	F Ve_for_testing_Smort_soc	ile Nai	me S_test_prog_bitm	File Date/Time	Checksum	USERCODE	Cable and I/O Settings	Cable Settings  Detect Cable Cable Cable: HW-US84-28 (FT0) Port: FTU58-0 Custom port: Programming Speed Settings  Use default Clock Divider Use custom Clock Divider TCK Divider Setting (0-10x) 1	
											Use default 1/0 settime	-
Output					Info*							ð ×
INFO - Check configuration	setup: Successful (Igr	nored JTAG Connection (	(hecking).	^		ID			Messi	ige		-
INFO - Device1 iCE5LP1K: F	Fast Program				٩	2342002	INFO - Scanning USB2	Port FTUSB-0	l			
INFO - Operation Done. No	errors.				U	85021074	INFO - Check configura	tion setup: St	tart.			
INFO - Elapsed time: 00 mi INFO - Operation: success	in : 01 sec ful.			##	Q	85021077	INFO - Check configura	tion setup: S	uccessful (Igno	red JTAG	Connection Checking).	
				•	m	85021278	INFO - Device1 iCE5LP	K: Fast Progr	am			٠
Output Tcl Console					Em	or"   Warning	Info*					57

Figure 5.27. iCE Family – Programming Completed Successfully



## 6. Ordering Information

Ordering part numbers for a particular socket are available at <u>http://www.latticesemi.com/sockets</u>



## **Technical Support**

For assistance, submit a technical support case at <u>www.latticesemi.com/techsupport</u>



## **Revision History**

Date	Version	Change Summary
February 2016	1.0	Initial release.



## **Appendix A: Debugging**

Check the following if the programming fails:

- USB power supply
- ON/OFF switch is turned ON to provide power to the socket
- Device scanning failed

Diamond Programmer *			ويراقح وتعالمه محمدها					-0-
e Edit View Design Help								
Enable Status Device Family Generic JTAG Devi	r Device cc JTAG-NOP	Operation Bypass	File Name	File Date/Time	Checksum	USERCODE	Coble and UD Settings	Cable Settings
tput			Info*					
ttice VM Drivers detected (RW-DUI-3C (P ogrammer device database loaded for - Scanning USI2 Port FTUSB-0 KROR - Relied to scan board. KROR - Scan Failed - Creating Blank Progr	arallel), HW-USBN-28 (FTDI)) ammer Project.		1D 32 2342002 IN	FO - Scanning USB2	Port FTUSB-C	Mes	isage	
Dutput Td Console			Error* Warning 1	info*				

### **Failed to Scan Device**

Click the **Detect Cable** button and the Diamond Programmer starts detecting all the cables attached to USB ports. In the **Cable** tab select the option which has the FTDI as shown in the figure below.

Diamon	d Programmer *										
Eile Edit	∑iew Design Help										
208	i 📰 📽 🖓 🖓 🚟									1.0	
Enable	Stati <u>ITAG Scan</u> wice Family Generic JTAG Device	Device JTAG-NOP	Operation Bypass	,	ile Na	me	File Date/Time	Checksum	USERCODE	Cable and I/O Settings	Cable Settings
utput					Info*						
RROR - Fail RROR - Sci	led to scan board. In Failed - Creating Blank Programmer	Project.		•		ID			Mess	age	
IFO - Cable	Auto Detection Activated.			100	Ð	2342002	INFO - Scanning USB2 I	Port FTUSB-0	)		
NFO - No La	attice HW-DUN-3C (parallel) cable dete	cted.			9	85021092	INFO - Cable Auto Dete	ection Activa	ited.		
NFO - No La	ttice HW-USBN-2A cable detected. I with FTDI USB Host Chip detected.			п	Q	85021094	INFO - No Lattice HW-I	DLN-3C (par	allel) cable det	ected.	
NFO - Multip	ple cables were detected.			-		85021096	INFO - No Lattice HW-I	JSBN-2A cal	ble detected.		
Output	Tcl Console				Err	or* Warning	I Info*				

### **Detect Cable (FTDI)**

Ensure that the ON/OFF switch is turned to the ON position. The Diamond Programmer starts scanning the device in the socket. When the scan is completed, the exact device present in the socket appears in the **Device** tab as shown in the figure on the next page.



the Nour These Breadle These								
1								
Enable Status Device Family	Device	Operation	P	le Name	File Date/Time	Checksum USER	RCODE	
MachXO3L	LCMXO3L-4300E	NVCM Erase,Program,Verify					e and I/O Settings	Cable Sectings  Cable: (MV-USBK-28 (FTD))  Pert: (FTUSB-0  Custom port:  Programming Speed Settings  Use default Clock Divider  Lise Armon Clock Divider
							CBB	TCK Divider Setting (0-10x) 1 (2) VO Settings Use default VO settings Use custom VO settings
utput				info*			Cebi	TCX Divider Setting (0-10x) 1 (2 VO Settings Uo default VO settings Uose default VO settings Uose cutom VO settings
tput. FO - Cable Auto Detection Activated.				info* ID			Message	TCX Divider Setting (0-10x) 1 (2 1/O Settings Uo Settings Uose default 1/O settings Uose custom 1/O settings
Aput FO - Cable Auto Detection Activoited. FO - No Lattice HW-DUI-3C (paroliel) cable d	detected.			1nfo* ID Q 2342002	INFO - Scanning USB2 F	fort FTUSB-0	Message	TCX Divider Setting (0-10x) 1 ( 10 Settings Use default VO settings Use cutsom VO settings
tput 10 - Cable Auto Detection Activated. 10 - No Lattice HW DUH-3C (perellet) cable 150 - No Lattice HW USBN 2A cable detected	Geterched. L.		•	1146°* ID 2342002 385021092	INFO - Scanning USB2 f	fort FTUSB-0	Message	TCX Divider Setting (6-10x) 1 ( 10 Settings Use default 1/0 settings Use cuttom 1/0 settings
tput IFO - Cable Auto Detection Activated. IFO - No Lattisce HW-DLY-3C (perellet) cable d IFO - No Lattisce HW-DLY-3C (perellet) cable d FO - No Lattisce HW-DLY-3C (perellet) cable d FO - No Auto: MY-DTO USB Host Chip detected	Geteched. L			info* ID 2342002 3 85021092	INFO - Scanning USB2 F	fort FTUSB-0	Message	TOX Divider Setting (0-10x) 1 (2 1/O Settings U Use leftuilt //O settings Use custom 1/O settings
utput IFO - Cable Auto Detection Activated. IFO - No Lattice HW DUH-3C (parellet) cable of IFO - No Lattice HW JSBN 2A cable detected IFO - Nutple Cable verse detected.	detected. L d.			anfo* ID 2342002 385021092 3) 85021094	INFO - Scanning USB2 F INFO - Cable Auto Dett INFO - No Lattice HW-F	Nort FTUSB-0 ction Activated. 2LN-3C (parallel) cr	Message able detected.	TCX Divider Setting (0-10x) 1 (2 VO Settings Use default VO settings Use custom VO settings
utput II <sup>II</sup> O - Cable Auto Detection Activated. II <sup>II</sup> O - No Lattice HW DUH-3C (parellet) cable of II <sup>II</sup> O - No Lattice HW-USBH-3A cable detected II <sup>II</sup> O - No Lattice HW-USBH-3A cable detected II <sup>II</sup> O - Multiple cables were detected. II <sup>II</sup> O - Seaming USBI Port FF1038 c	Gebected. L. d.		•	Info           ID           ID	INFO - Scanning USB2 F INFO - Cable Auto Dete INFO - No Lattice HW-1	fort FTUSB-0 ction Activated. DLN-3C (parallel) cr	Message able detected.	TCX Divider Setting (0-10x) 1 (2) VO Settings Uo default VO settings Use outom VO settings

Scanning Completed



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