

# SmartLynq Data Cable Quick Start Guide

The Xilinx® SmartLynq Data Cable is a high performance JTAG cable for Xilinx programmable devices. This guide provides instructions for setting up and connecting the SmartLynq Data Cable using an Ethernet connection or a USB cable.



For more information, visit <u>www.xilinx.com/SmartLynq</u>.

# **Install Vivado Tools**

Install Vivado® Lab Edition or the Vivado Design Suite:

- Go to <u>www.xilinx.com/SmartLynq</u> for installation instructions.
   <u>Note</u>: Vivado Lab Edition does not require a license. Also, the Vivado Design Suite WebPACK<sup>™</sup> tools installation is free and does not require a license.
- b. When running the installer, ensure the **Install Cable Drivers** option is enabled. If you need assistance, review the Vivado installation guide at <u>www.xilinx.com/kits/vivadoinstall</u>.
- c. Launch the Vivado tool and open the **Hardware Manager.** Refer to *Vivado Design Suite User Guide: Programming and Debugging* (UG908) for more information.

### SmartLynq Data Cable Connectors



SmartLyng Data Cable network connection with a target board



DC power, USB Type-B, and Ethernet jacks are on the left side of the SmartLynq Data Cable.



The JTAG ribbon cable and GPIO 2x6 cable connectors are on the right side of the SmartLyng Data Cable.



# **Setup—Connect through Ethernet**

### **STEP 1**: Connect the power and Ethernet cable to the SmartLynq Data Cable module.

- a. Plug the power adapter barrel plug into the DC power jack on the SmartLyng module.
- b. Plug the Ethernet cable into the SmartLynq module and attach it to your network.
- c. Attach the appropriate country plug to the power adapter and plug into an open AC outlet.
- d. The SmartLynq Data Cable powers up and the display shows self-check information.
- e. The SmartLynq Data Cable acquires and displays an IP address, for example:



#### **STEP 2**: Connect the SmartLynq Data Cable to the target board.

- a. Connect the SmartLyng Data Cable module to the JTAG interface on the target board.
- b. Open the Hardware Manager in the Vivado tool.
- c. To create a new hardware target, click **Open Target** and choose **Open New Target**.
- d. The Open New Hardware Target wizard appears. Click Next.
- e. In the **Connect to** list box, pull-down **Remote server**.
- f. In the Host name field, specify the IP address shown on the SmartLynq module display. Click Next.

elect local or rem	ofe hardware server, then configure the host name and port settings. Use Local server if the target is attached to the	
cai machine; othe	rwise, use Remote server.	
Connect to:	emote server (target is on remote machine)	
Remote Server		
Host name:	172.20.9.26	
Port:	3121 [default is 3121]	
01-1-11-11-1	nch and/or connect to the hw_server (port 3121) application on the remote machine '172.20.13.51'.	
Click Next to lau		

On the SmartLynq Data Cable module display, VREF ON appears if the target board is powered up and VREF OFF appears if the target board does not have power.

Note: The target board must be powered on in order to connect with the Vivado Hardware Manager. With the board powered on, you can connect using the Open New Hardware Target wizard.



The SmartLynq Data Cable module defaults to a JTAG clock (TCK) frequency of 40 MHz:

🍌 Open New Hardv	Open New Hardware Target					
Select Hardw Select a hardwar expected devices	Select Hardware Target Select a hardware target from the list of available targets, then set the appropriate JTAG clock (TCK) frequency. If you do not see the expected devices, decrease the frequency or select a different target.					
Hardware <u>T</u> ar	jets					
Туре	Name	JTAG Clock Freque	ncy			
Xilinx_tcf	Xilinx/AAo1A11n0	4000000	$\mathbf{v}$			
Hardware <u>D</u> ev	Add Xilinx Virtual Cable (XVC) Hardware Devices (for unknown devices, specify the Instruction Register (IR) length)					
				No device		
Hardware serv	er: 172.20.9.26:3121					
?				<back next=""> Finish</back>	Cancel	

If no devices on the target board are listed under **Hardware Devices**, lower the JTAG clock frequency to 10 MHz (for example) to detect devices:

Open New Hardware Target					
Select Hardware Select a hardware expected devices,	are Target e target from the l decrease the fre	ist of available tai equency or select	rgets, then set the appropriate JTAG clock (TCK) frequency. If you do not see the a different target.	4	
Hardware <u>T</u> arg	ets				
Туре	Name	JTAG Clock	Frequency		
Xilinx_tcf	Xilinx/AAo1A11r	0 1000000	¥		
Hardware <u>D</u> evi	ces (for unknow	n devices, speci	fy the Instruction Register (IR) length)		
@ arm dap	0 4BA00477	4		^	
@ xc7z020_1	23727093	6		~	
Hardware serve	er: 172.20.9.26:3	121			
?			< <u>Back</u> <u>N</u> ext > Einish	Cancel	



# Setup—Connect through USB (Windows Systems)

### **STEP 1**: Connect the USB cable to the SmartLynq Data Cable module.

a. Plug a USB cable with a Type-B connector into the SmartLynq module USB port and the other end into the Windows host system.

Note: The USB port supplies power to the SmartLynq Data Cable module so the power adapter is not required.

b. The Windows driver update launches and installs the driver. If you monitor the installation process, dialog boxes similar to these appear:

Driver Software Installation		
Installing device driver software		
Smart JTAG Cable	O Installing driver software	
		Close
Driver Software Installation	State States - States	X
Smart JTAG Cable installed		
Smart JTAG Cable	Ready to use	

- c. After the driver is installed, unplug and plug back in the SmartLyng module to reinitialize.
- d. After initialization, an IP address appears on the display.
- e. Connect the SmartLynq Data Cable to the target board using the Hardware Manager as described in Step 2 on page 3.

Close



# Setup—Connect through USB (Linux Systems)

### **STEP 1**: Connect the USB cable to the SmartLynq Data Cable module.

a. Plug a USB cable with a Type-B connector into the SmartLynq module USB port and the other end into the Linux host system.

Note: The USB port supplies power to the SmartLynq Data Cable module so the power adapter is not required.

- b. The SmartLyng Data Cable module powers up. Self-check information appears on its display.
- c. An IP address appears on the display.

### **STEP 2**: Optional: Connect the SmartLynq Data Cable module to the target board.

This optional step shows how to set up the network interface for the SmartLyng Data Cable, if required.

- a. Connect the SmartLynq Data Cable module to the JTAG interface on the target board.
- b. Open the Hardware Manager in the Vivado tool.
- c. In the **Connect to** list box, pull-down **Remote server.**
- d. In the Host name field, specify the IP address shown on the SmartLynq module display. Click Next. Note: If the Hardware Manager cannot connect to the SmartLynq Data Cable, run the ifconfig command to set up the network interface (Step 3).

### **STEP 3**: Set up the network interface for the SmartLynq Data Cable (if required).

Run the *ifconfig* command to configure the network interface depending on the IP address Linux assigned to the SmartLynq Data Cable.

For example, Linux assigns the IP address 10.0.0.2 to the SmartLynq Data Cable. Run ifconfig to view the currently active network interfaces on this system. Here is an example:

eth0	Link encap:Ethernet HWaddr D7:45:89:22:88:97 inet addr:172.19.3.148 Bcast:172.19.3.255 Mask:255.255.252.0 UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1 RX packets:2278375690 errors:0 dropped:307 overruns:0 frame:0 TX packets:2305014867 errors:0 dropped:22 overruns:0 carrier:0 collisions:0 txqueuelen:1000 RX bytes:1026403610964 (955.9 GiB) TX bytes:1048839754879 (976.8 GiB) Interrupt:17
lo	Link encap:Local Loopback inet addr:127.0.0.1 Mask:255.0.0.0 UP LOOPBACK RUNNING MTU:16436 Metric:1 RX packets:41586323 errors:0 dropped:0 overruns:0 frame:0 TX packets:41586323 errors:0 dropped:0 overruns:0 carrier:0 collisions:0 txqueuelen:0 RX bytes:107897957583 (100.4 GiB) TX bytes:107897957583 (100.4 GiB)



If none of the interface names have an Internet address that is part of the protocol address family that covers the assigned SmartLyng Data Cable address, use *ifconfig* to configure a new interface.

In the preceding example, the Linux system has two interfaces defined—eth0 and lo. Neither interface has an Internet address like 10.0.x.x that includes the address 10.0.0.2 assigned to the SmartLynq Data Cable. Set up the interface by running ifconfig with the following arguments:

sudo ifconfig ethl 10.0.0.1 netmask 255.255.0.0

Run ifconfig again to show the new interface:

eth0	Link encap:Ethernet HWaddr D7:45:89:22:88:97 inet addr:172.19.3.148 Bcast:172.19.3.255 Mask:255.255.252.0 UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1 RX packets:2278375690 errors:0 dropped:307 overruns:0 frame:0 TX packets:2305014867 errors:0 dropped:22 overruns:0 carrier:0 collisions:0 txqueuelen:1000 RX bytes:1026403610964 (955.9 GiB) TX bytes:1048839754879 (976.8 GiB) Interrupt:17
ethl	Link encap:Ethernet HWaddr 00:5D:03:00:00:01 inet addr:10.0.0.1 Bcast:10.0.255.255 Mask:255.255.0.0 UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1 RX packets:10 errors:0 dropped:0 overruns:0 frame:0 TX packets:2 errors:0 dropped:0 overruns:0 carrier:0 collisions:0 txqueuelen:1000 RX bytes:2396 (2.3 KiB) TX bytes:345 (345.0 b)
lo	Link encap:Local Loopback inet addr:127.0.0.1 Mask:255.0.0.0 UP LOOPBACK RUNNING MTU:16436 Metric:1 RX packets:41586323 errors:0 dropped:0 overruns:0 frame:0 TX packets:41586323 errors:0 dropped:0 overruns:0 carrier:0 collisions:0 txqueuelen:0 RX bytes:107897957583 (100.4 GiB) TX bytes:107897957583 (100.4 GiB)



### **Next Steps**

#### Learn More

To learn more, please go to the product page <u>www.xilinx.com/SmartLynq</u> for additional resources.

#### Support

For support options related to this product, see the Xilinx support website at www.xilinx.com/support.

#### Warranty

For the product warranty, go to www.xilinx.com/kits/warranty.

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