4. FIRMWARE UPDATE PROCEDURE

FW Update Tool

The firmware (FW) of UCD-400 is programmed with a separate tool called **Quartus Prime (includes Nios II EDS)**. The tool can be downloaded from **Intel® FPGA** website:

https://fpgasoftware.intel.com/?edition=lite

On the download page, please **Select release 16.1.** Please download **Quartus Prime** (includes Nios II EDS).

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A newer version of the Quartus Prime Design Software Quartus Prime Design Software. This version does not incl nd security updates. For critical support requests, please	is available. Users should upgrade to the latest version of the latest open source components that have functional contact our support team.
You may be exposed to a vulnerability issue if you have rom v11.0 to v18.0 to a location with space(s) in the path.	e installed or plan to install Quartus Prime/Quartus II softwa See this <u>KDB solution</u> for more details.
The Quartus Prime Lite software version 16.1 supports IAX II, MAX V, and MAX 10 FPGA. <u>More</u>	; the following device families: Arria II, Cyclone IV, Cyclone V
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Note: Registering is needed for the download.

Please download and install the tool in the PC.

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Connect to the UCD-400 Unit

- ▶ Power on the UCD-400.
- Connect UCD-400 with a USB cable to the PC through Programmer connector. (Pls refer to page 7)

The programming interface is the Ethernet connector in the UCD-400 unit. The PC can be connected to the UCD-400 unit either through a network HUB or directly.

Please follow either of the two procedures below.

Connecting Through Ethernet Network (Alternative 1)

• Connect UCD-400 though **Ethernet** connector to the same network HUB where the programming PC is connected.

Connecting with Direct Ethernet Cable (Alternative 2)

In case of direct connection, the PC needs to be configured to be an Ethernet network host by enabling WIFI network share (The WIFI network will not be used for programming).

- Connect UCD-400 directly to the PC though **Ethernet** connector;
- Enable **WIFI** Internet access of the PC.
- From Network and Sharing Center click on the WiFi connection
- In Wi-Fi Status dialog click **Properties** and select **Sharing** tab
- Select Allow other network users to connect through this computer's Internet connection
- Click **OK** and **Close**.





The network sharing is shown above for Windows 10. Similar controls can be found for other Windows versions and other operating systems.

Programming the FW

		Run Nios II 16.1 Command Shell application as Administrator	
Note		<i>Nios II 16.1 Command Shell</i> application needs to be run as Administrator (Right click with mouse and select Run as Administrator)	
Hint		Right click on the top edge of <i>Command Shell</i> and select Edit > Paste to paste the commands below	
	►	Select FW update folder location. For example:	
		cd /cygdrive/c/Program\ Files\ \(x86\)/Unigraf/TSI/UCD-400/Firmware	1
	►	Run the boot loader that initiates the HTML programming interface.	
		source run.sh	
		Upon command completion, the assigned IP address for UCD-400 device is highlighted in the picture below.	
		/cygdrive/c/Program Files (x86)/Unigraf/TSI/UCD-400/Firmware —	
		jsa@t440s /cygdrive/c/Program Files (x86)/Unigraf/TSI/UCD-400/Firmware	^
		Searching for SOF file:	
		aio_tpga_oup.sot Warning (210120): Arria 10 information is incomplete. The ISP clamp functionality will be disabled.	
		Info: ************************************	
		Info (213045): Using programming cable "USB-BlasterII [USB-1]" Info (21301): Using programming cable "USB-BlasterII [USB-1]" Info (213011): Using programming file a10_fpga_bup.sof with checksum 0x30E7799E for device 10ax115s3f45e2sge3@1	
		Info (20906): Started Programmer Operation at Mon Jan 20 11:13:25 2020 Info (209016): Configuring device index 1 Info (209017): Device 1 contains JTAG ID code 0x02E660D0	
		Info (209007): Configuration succeeded 1 device(s) configured Info (209011): Successfully performed operation(s)	
		Info (2090)): Ended Programmer operation at won Jan 20 11:13:40 2020 Info: Quartus Prime Programmer was successful. 0 errors, 1 warning Info: Peak virtual memory: 5626 megabytes	
		Info: Processing ended: Mon Jan 20 11:13:40 2020 Info: Elapsed time: 00:00:29 Nofo: Elapsed time: 00:00:29	
		Using cable "USB-BlasterII [USB-1]", device 1, instance 0x00 Pausing target processor: OK	
		Initializing CPU cache (if present) OK Downloaded 411KB in 0 45 (1027 5KB/s)	İ
		Verified OK Waiting to allow other programs to start: done	
		Starting processor at address 0x102002BC nios2-terminal: connected to hardware target using JTAG UART on cable nios2-terminal: "UBS.RlattentT [USS.Rl]: device 1 instance 0	
		nios2-terminal: (Use the IDE stop button or Ctrl-C to terminate)	
		PHY INFO: [phyid] 0x0 0x141 0xcc2	
		PHY INFO: [phyid] 0x0 0x141 0xcc2	
		InterNiche Portable TCP/IP, v3.1	
		prep_tse_mac 0	
		Your Ethernet MAC address is 00:07:ed:2a:09:44 prepped 1 interface, initializing [tse mac init]	
		INFO : TSE MAC 0 found at address 0x10003000 INFO : PHY Marvell 88E1111 found at PHY address 0x00 of MAC Group[0]	
		INFO : PHY[0.0] - Automatically mapped to tse mac_device[0] INFO : PHY[0.0] - Restart Auto-Negotiation, checking PHY link INFO : PHY[0.0] - Auto-Negotiation PASSED	
		INFO : PCS[0.0] - Configuring PCS operating mode INFO : PCS[0.0] - PCS SGMII mode enabled	
		INFO : PHY[0.0] - Checking Ink INFO : PHY[0.0] - Link established INFO : PHY[0.0] - Speed = 1000, Duplex = Full	
		OK, x=0, CMD_CONFIG=0x00000000	
		The post-initialization. Che_control=0x000000000 [tse_sgdma_read_init] RX descriptor chain desc (1 depth) created mctest init called	
		IP address of et1 : 0.0.0.0 Created "Inet main" task (Prio: 2) Created "inet wist" task (Prio: 2)	
		Acquired IP address via DHCP liferface: et1 IP address : 194.110.112.79	
		Subnet Mask: 255.255.255.0 Gateway : 194.110.112.1	~

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- Launch web browser on the PC. If Ethernet connection is used, please make sure that the PC is connected to the same network as the UCD-400 unit.
- Access the HTML programming interface by entering the IP address assigned for the UCD-400 unit.

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- Browse Hardware File Name for UCD-400 update (e.g. a10_dptrx_p1.flash) and then press "Upload" button
- Once uploading process done cycle power on the UCD-400.

Note Please cycle the power on the UCD-400 unit to enable the FW update.