



# Quartus Prime Standard Edition Software and Device Support Release Notes

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# 1 Quartus Prime Standard Edition Software and Device Support Release Notes Version 16.1

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This document provides late-breaking information about the Intel® Quartus® Prime Standard Edition software release version 16.1.

For information about operating system support, refer to the `readme.txt` file in your `intelFPGA/<version number>/quartus` directory.

## Related Links

[Quartus Prime Pro Edition Software and Device Support Release Notes Version 16.1](#)

## 1.1 New Features and Enhancements

The Quartus Prime Standard Edition software release version 16.1 includes the following new features and enhancements:

- Intel branding in Quartus Prime software user interfaces, installation, and legal texts.
- Improved Quartus Prime Programmer GUI that accepts `.flash` files.  
For more information on this enhancement, contact [support](#).
- Support for additional `nios2-flash-programmer` command-line options in `quartus_pgm`.

## 1.2 Operating System Support

Information about OS support for the Quartus Prime Design Suite® is available on the Operating System Support page of the Altera website.

## Related Links

[Operating System Support](#)

## 1.3 Memory Recommendations

A full installation of the Quartus Prime software requires up to 24 GB of available disk space.

Intel recommends that your system be configured to provide virtual memory equal to the recommended physical RAM that is required to process your design.

**Note:** Peak virtual memory may exceed these recommendations. These recommendations are based on the amount of physical memory required to achieve runtime within 10% of that achieved on hardware with an infinite amount of RAM.



**Table 1. Memory Requirements for Processing Designs**

These requirements are the same for both Windows and Linux installations.

Family	Device	Recommended Physical RAM
Arria® 10	10AT115, 10AX115	48 GB
	10AX090	44 GB
	10AS066, 10AX066	32 GB
	10AS057, 10AX057	30 GB
	10AS048, 10AX048	28 GB
	10AX032, 10AS032	24 GB
	10AX027, 10AS027	22 GB
	10AX022, 10AS022	20 GB
	10AX016, 10AS016	18 GB
Arria V	5AGXB5, 5AGTD7, 5AGXB7, 5ASXB5, 5ASTD5	16 GB
	5AGXB1, 5AGXB3, 5AGTD3, 5ASTD3, 5ASXB3	12 GB
	5AGXA7, 5AGTC7	10 GB
	5AGTC3, 5AGXA3, 5AGXA5	8 GB
	5AGXA1	6 GB
Arria V GZ	5AGZE7	16 GB
	5AGZE3, 5AGZE5	12 GB
	5AGZE1	8 GB
Arria II GX	EP2AGX260	6 GB
	EP2AGX95, EP2AGX125, EP2AGX190	4 GB
	EP2AGX65	2 GB
	EP2AGX45	1.5 GB
Arria II GZ	EP2AGZ350	8 GB
	EP2AGZ300	6 GB
	EP2AGZ225	4 GB
Cyclone® V	5CEA9, 5CGTD9, 5CGXC9	8 GB
	5CEA2, 5CGXC3, 5CEA4, 5CGXC4, 5CEA5, 5CGTD5, 5CGXC5, 5CSEA5, 5CSTD5, 5CSXC5, 5CSEA6, 5CSXC6, 5CEA7, 5CGTD7, 5CGXC7, 5CSEA2, 5CSEA4, 5CSXC2, 5CSXC4, 5CSTD6	6 GB
Cyclone IV E	EP4CE115	1.5 GB
	EP4CE55, EP4CE75	1 GB
	EP4CE6, EP4CE10, EP4CE15, EP4CE22, EP4CE30, EP4CE40	512 MB
Cyclone IV GX	EP4CGX110, EP4CGX150	2 GB
	EP4CGX50, EP4CGX75	1.5 GB
	EP4CGX15, EP4CGX22, EP4CGX30	512 MB
MAX® 10	10M50	2 GB

*continued...*



Family	Device	Recommended Physical RAM
	10M16	2 GB
	10M25	2 GB
	10M40	2 GB
	10M04, 10M08	1 GB
	10M02	512 MB
MAX V	All	512 MB
MAX II	All	512 MB
Stratix® V	5SEEB, 5SGXAB, 5SGXB9, 5SGXBB	28 GB
	5SGXA9, 5SEE9	24 GB
	5SGTC7, 5SGXA7, 5SGSD8	20 GB
	5SGSD5, 5SGXA5, 5SGXB5, 5SGSD6, 5SGXB6	16 GB
	5SGXA3, 5SGSD4, 5SGXA4, 5SGTC5	12 GB
	5SGSD3	8 GB
Stratix IV	EP4SGX530, EP4SE530, EP4SE820, EP4S40G5, EP4S100G5	12 GB
	EP4SE360 EP4SGX360, EP4S100G3, EP4S100G4	8 GB
	EP4SGX290	6 GB
	EP4SE230 EP4SGX110, EP4SGX230, EP4S40G2, EP4S100G2	4 GB
	EP4SGX70	2 GB

## 1.4 Changes in Device Support

**Table 2. Device Support Not Fixed**

Description	Workaround
N/A	N/A

### Related Links

#### [Knowledge Base](#)

For more information about known device issues and workarounds.

## 1.5 Changes to Software Behavior

This section documents instances in which the behavior and default settings of the Quartus Prime Standard Edition software have been changed from earlier releases of the Quartus Prime Standard Edition software.

Refer to the Quartus Prime Default Settings File (.qdf), *<Quartus Prime installation directory>/quartus/bin/assignment\_defaults.qdf*, for a list of all the default assignment settings for the latest version of the Quartus Prime software.



### Talkback feature is removed in the Quartus Prime software

The Talkback feature has been removed from the Quartus Prime software GUI and installation. Any feature that previously required Talkback will now work without restrictions.

### Migration of a design between Quartus Prime Pro Edition software and Quartus Prime Standard Edition software, and vice versa, is not supported

The two software editions use different Quartus Prime project databases and assignments. You cannot open a design that you created in the Quartus Prime Pro Edition software in the Quartus Prime Standard Edition software. For more information on migrating a design to the Quartus Prime Pro Edition software, refer to the [Migrating to Quartus Prime Pro Edition](#) section of the *Quartus Prime Pro Edition Handbook* software.

### CTLE Triggered Adaptation Mode is no longer supported for Arria 10 devices

In the Transceiver Toolkit, the pull-down menu of the **Equalization Control** tab offers both continuous time-linear equalization (CTLE) **Triggered Adaptation** and **Manual** modes. You can only use CTLE in **Manual** mode for Arria 10 devices.

## 1.6 Device Support and Pin-Out Status

All production devices currently have full compilation, simulation, timing analysis, and programming support.

## 1.7 Timing and Power Models

**Table 3. Timing and Power Model Status**

Device Family	Device	Timing Model Status	Power Model Status
Arria 10	10AX016, 10AS016, 10AX022, 10AS022, 10AX027, 10AS027, 10AX032, 10AS032,	Final – 16.1 <sup>1</sup>	Preliminary
	10AX048, 10AS048	Final – 16.0.2	
	10AX057, 10AS057, 10AX066, 10AS066, 10AX090	Final – 16.0.1	Final – 16.0.1
	10AX115, 10AT115	Final – 16.0	Final – 16.0
Arria V <sup>2</sup>	5AGXB5, 5AGXB7	Final – 12.1 SP1 <sup>3</sup>	Final – 13.1
	5AGTD7		Final – 14.0
	5AGXA1, 5AGXA3, 5AGTC3	Final – 13.0 SP1 <sup>3</sup>	Final – 14.0

*continued...*

- 1 Timing models are preliminary for 10AX16-32/10AS16-32 fastest speed grade (-1), and final for medium and slow speed grades.
- 2 Although these models were finalized in the Quartus Prime software version 14.0, they were updated again in the Quartus Primesoftware version 15.0.2.
- 3 The timing model was updated in the Quartus Prime software version 15.1.



Device Family	Device	Timing Model Status	Power Model Status
	5AGXA5, 5AGXA7	Final – 13.1 <sup>3</sup>	Final – 14.0
	5AGXB1, 5AGXB3, 5AGTD3	Final – 13.0 <sup>3</sup>	Final – 13.1
	5AGTC7	Final – 13.1 <sup>3</sup>	Final – 13.1
Arria V GZ	All	Final – 12.1 SP1 <sup>4</sup>	Final – 13.0
Arria V SoC <sup>2</sup>	5ASXB3, 5ASXB5, 5ASTD3, 5ASTD5	Final – 14.0 <sup>3</sup>	Final – 14.0
Cyclone V	5CEA2, 5CEA4, 5CEA7, 5CEA9, 5CGXC7, 5CGXC9, 5CGTD7, 5CGTD9	Final – 13.0 SP1	Final – 13.1
	5CEA5, 5CGXC4, 5CGXC5	Final – 13.1	Final – 13.1
	5CGXC3		Final – 14.0
Cyclone V SoC	5CSEA2, 5CSEA4, 5CSXC2, 5CSXC4	Final – 14.0	Final – 14.1
	5CSEA5, 5CSEA6, 5CSXC5, 5CSXC6, 5CSTD5, 5CSTD6		Final – 14.0
Stratix V	5SGXA7, 5SGXA5, 5SGTC5, 5SGTC7	Final – 12.1 <sup>4</sup>	Final – 13.0
	5SGSD3, 5SGSD4, 5SGSD5, 5SGXA3, 5SGXA4, 5SGXB5, 5SGXB6, 5SGXAB, 5SGXA9, 5SEE9, 5SEEB, 5SGXB9, 5SGXBB	Final – 12.1 SP1 <sup>4</sup>	Final – 13.0
	5SGSD6, 5SGSD8	Final – 13.0 SP1 <sup>4</sup>	Final – 13.0
MAX 10	10M02, 10M04, 10M08	Final – 15.1 <sup>5</sup>	Final – 15.1
	10M16, 10M25, 10M40, 10M50	Preliminary	Final – 15.1

The current version of the Quartus Prime software also includes final timing and power models for the Arria II GX, Arria II GZ, Cyclone IV E, Cyclone IV GX, MAX II, MAX II Z, MAX V, and Stratix IV device families. Timing models for these device families became final in the Quartus Prime software versions 11.1 or earlier.

### Related Links

[System Design with Advance FPGA Timing Models](#)

## 1.8 IBIS Models

**Table 4. IBIS Model Status for the Quartus Prime Standard Edition Software Release Version 16.1**

Beginning in the Quartus Prime Standard Edition software version 16.0, device families will have IBIS model statuses that are either Advance, Preliminary, or Final.

<sup>4</sup> The timing model was updated in the Quartus II software version 13.1.

<sup>5</sup> Timing model statuses for MAX 10 A6 speed grade parts remain as Preliminary.



Device Family	IBIS Model Status
Arria 10	Final – 16.1
Arria V	Correlated with PHY device operation – 14.0
Arria II GX	Correlated with PHY device operation – 11.1
Arria II GZ	Correlated with PHY device operation – 11.1
Cyclone V	Correlated with PHY device operation – 14.0
Cyclone IV E	Correlated with PHY device operation – 11.1
Cyclone IV GX	Correlated with PHY device operation – 11.1
MAX 10	Final – 16.0
MAX V	Correlated with PHY device operation – 11.1
Stratix V	Correlated with PHY device operation – 13.0 SP1
Stratix IV	Correlated with PHY device operation – 11.1

## 1.9 EDA Interface Information

**Table 5. Synthesis Tools Supporting the Quartus Prime Standard Edition Software Release Version 16.1**

Synthesis Tools <sup>6</sup>	Version	NativeLink Support
Mentor Graphics® Precision	2016a	Yes
Synopsys® Synplify, Synplify Pro, and Synplify Premier	2.15.06.09	Yes

**Table 6. Simulation Tools Supporting the Quartus Prime Standard Edition Software Release Version 16.1**

Simulation Tools	Version	NativeLink Support
Aldec Active-HDL	10.3 (Windows only)	Yes
Aldec Riviera-PRO	2015.10	Yes
Cadence Incisive Enterprise Simulator (IES)	14.20 (Linux only)	Yes
Mentor Graphics® ModelSim® PE	10.4d	Yes
Mentor Graphics ModelSim SE	10.4d	Yes
Mentor Graphics ModelSim-Intel FPGA Edition	10.5b	Yes
Mentor Graphics Questa®	10.4d	Yes
Synopsys VCS and VCS MX	2014.12-SP1 (Linux only)	Yes

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<sup>6</sup> EDA Synthesis tools that support the Quartus Prime software version 16.1 will be released by vendors shortly after the release of the Quartus Prime software. Contact your vendor account manager for details.





### OS support for Mentor Graphics ModelSim-Intel FPGA Edition version 10.5b (requires 32-bit libraries)

- Windows 7 SP1 (64-bit)
- Windows 8.0 (64-bit)
- Windows 10 (64-bit)
- Windows Server 2008 R2 SP1(64-bit)
- Red Hat Enterprise Linux 5.10 (64-bit)
- Red Hat Enterprise Linux 6.5 (64-bit)
- Red Hat Enterprise Linux 7.2 (64-bit)

## 1.10 Antivirus Verification

The Quartus Prime software release version 16.1 has been verified virus free using the following software:

### Antivirus Verification Software for Windows

McAfee Agent Version: 5.0.1.516  
 McAfee VirusScan Enterprise + AntiSpyware Enterprise Version: 8.8.0 (8.8.0.1445)  
 Scan Engine Version (32 bit): 5800.7501  
 Scan Engine Version (64 bit): 5800.7501  
 DAT Version: 8319.0000

## 1.11 Software Issues Resolved

**Table 7. Issues Resolved in the Quartus Prime Software Release Version 16.1**

Customer Service Request Numbers							
10961702	11185575	11209519	11220048	11227587	11234133	11241006	11250528
11004820	11186023	11209864	11220052	11227782	11234248	11241129	11250580
11030244	11190462	11210162	11220201	11227957	11234666	11241262	11250604
11034453	11192474	11210192	11220242	11228529	11234927	11241802	11250637
11057839	11193619	11210221	11220300	11228943	11235031	11241806	11250643
11072065	11194491	11210503	11220362	11228962	11235127	11241980	11250650
11074518	11194757	11210624	11220511	11229199	11235142	11241990	11250993
11109108	11194797	11210652	11221016	11229262	11235166	11241997	11251149
11117851	11194934	11210674	11221085	11229585	11235216	11242005	11251164
11120228	11194987	11210743	11221115	11229599	11235333	11242293	11251173
11123880	11196250	11211363	11221293	11229635	11235484	11242555	11251212
11126564	11197031	11211489	11221709	11229911	11235553	11242924	11251238
11126587	11197308	11211763	11221746	11230132	11235667	11243225	11251677
11137782	11197989	11211852	11221905	11230261	11235810	11243408	11251817
11139942	11199614	11212663	11221984	11230290	11236181	11243461	11252156
<i>continued...</i>							



Customer Service Request Numbers							
11146481	11199895	11213533	11221998	11230325	11236182	11243542	11252263
11148053	11200036	11213575	11222606	11230605	11236318	11243652	11252393
11151094	11200368	11213651	11222806	11230886	11236638	11243696	11252577
11156456	11201079	11214568	11222904	11231147	11237103	11243880	11252589
11160592	11201562	11214607	11222915	11231206	11237142	11243948	11252710
11161246	11201714	11214777	11223025	11231243	11237208	11244080	11253153
11163367	11201948	11214898	11223575	11231310	11237209	11244318	11253764
11165913	11202443	11215018	11223615	11231395	11237608	11244515	11253923
11166988	11202460	11215355	11224092	11231412	11237795	11245156	11254162
11167695	11202591	11216515	11224134	11231467	11237980	11245410	11254820
11170433	11202640	11216568	11224409	11231702	11238084	11245411	11254871
11171353	11203123	11216911	11224535	11231817	11238092	11245483	11254956
11172790	11203295	11217279	11224661	11231935	11238325	11246266	11256025
11173271	11204520	11217346	11224799	11232246	11238659	11246290	11256563
11175702	11205582	11217868	11224939	11232386	11238743	11246499	11257216
11177929	11206449	11217884	11225293	11232399	11238764	11246601	11257546
11177994	11206459	11218074	11225641	11232596	11238966	11246676	11257583
11178269	11206502	11218249	11225922	11232912	11239171	11247632	11257997
11178413	11206937	11218252	11225981	11232919	11239471	11247920	11258170
11179777	11207520	11218264	11226031	11233047	11239619	11248390	11258206
11179909	11207823	11218331	11226111	11233107	11240019	11248399	11258505
11179913	11207952	11218542	11226189	11233398	11240073	11248670	11258562
11179987	11208492	11218869	11226632	11233444	11240100	11249835	11258857
11180302	11208494	11218921	11226683	11233507	11240152	11249898	11259093
11180405	11208685	11219375	11226751	11233595	11240153	11250003	11260965
11181789	11208768	11219427	11227163	11233936	11240162	11250322	11262365
11183528	11208788	11219689	11227270	11234016	11240453	11250409	11262897
11184225	11209022	11219907	11227280	11234029	11240751	11250507	11263672
11185097	11209076	11219913	11227380	11234088	11240827	11250524	11341727



## 1.12 Software Patches Included in this Release

**Table 8. Software Patches included in the Quartus Prime Software Release Version 16.1**

Software Version	Patch	Customer Service Request Number
Quartus Prime software version 16.0eap2	0.09eap2	—
Quartus Prime software version 16.0eap2	0.08eap2	11217891
Quartus Prime software version 16.0eap2	0.06eap2	11226071
Quartus Prime software version 16.0eap2	0.02eap2	11217884
Quartus Prime software version 16.0.2	2.16	11250643
Quartus Prime software version 16.0.2	2.13p	11258443
Quartus Prime software version 16.0.2	2.13	11258443
Quartus Prime software version 16.0.2	2.10	11253998
Quartus Prime software version 16.0.2	2.08	—
Quartus Prime software version 16.0.2	2.06	11250660, 11234840
Quartus Prime software version 16.0.2	2.04	11231206
Quartus Prime software version 16.0.2	2.01	—
Quartus Prime software version 16.0.1	1.19	—
Quartus Prime software version 16.0.1	1.18	11250660, 11234840
Quartus Prime software version 16.0.1	1.17	11232912
Quartus Prime software version 16.0.1	1.15	11237209
Quartus Prime software version 16.0.1	1.04	11226508
Quartus Prime software version 16.0	0.13	11251931
Quartus Prime software version 16.0	0.10	11220362
Quartus Prime software version 16.0	0.08	11235216
Quartus Prime software version 16.0	0.04	11226508
Quartus Prime software version 16.0	0.01	11171353
Quartus Prime software version 15.1.2	2.36	11246499

*continued...*



Software Version	Patch	Customer Service Request Number
Quartus Prime software version 15.1.2	2.34	—
Quartus Prime software version 15.1.2	2.19	—
Quartus Prime software version 15.1.2	2.13	11197031
Quartus Prime software version 15.1.2	2.10	—
Quartus Prime software version 15.1.1	1.14	11226508
Quartus Prime software version 15.1	0.26p	11220362, 11260404
Quartus Prime software version 15.1	0.26	11220362, 11260404
Quartus II software version 14.1	0.42	11219427, 11218869
Quartus II software version 14.0	0.46	11188315

### 1.13 Latest Known Quartus Prime Software Issues

Information about known issues that affect the Quartus Prime software version 16.1 is available on the Knowledge Base webpage .

[Known Software Issues Affecting the Quartus Prime Software Version 16.1](#)

**Table 9. Important Known Issues Affecting the Quartus Prime Software Version 16.1**

Description	Workaround
Post-fit simulation for all 28-nm device families are not functional in the Quartus Prime Standard Edition software.	—

You can find known issue information for previous versions of the Quartus Prime software on the Knowledge Base webpage.

Information about known software issues that affect previous versions of the Quartus II software is available on the Quartus Prime and Quartus II Software Support webpage.

Information about issues affecting the Intel FPGA IP Library is available in the *Intel FPGA IP Release Notes*.

#### Related Links

- [Knowledge Base](#)
- [Quartus Prime and Quartus II Software Support](#)
- [Intel FPGA IP Release Notes](#)

### 1.14 Document Revision History

**Table 10. Quartus Prime Software Release Version 16.1 Document Revision History**

Date	Version	Changes
November 2016	16.1.0	Initial release.