

How to improve the quality of wireless connection? (For 802.11 AC Wireless Adapter: Intel® Dual Band Wireless-AC 3160 / 7260 & Killer Wireless AC 1525)

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FAQ No. 01178

Improve the quality of wireless connection

Affected Model: Models with 802.11ac WLAN adapter

Please check the Wireless Standard and the Wireless Band of your router (802.11n 2.4 GHz / 5 GHz, 80211ac 5GHz), see the table below for all suggested items and try to change the advanced setting of the WLAN adapter in the system.

*Note: Some settings on the wireless router may have conflict with the advanced setting of the WLAN adapter, please try different combination of the settings to optimize the wireless connection.

Intel 802.11 AC WLAN Adapter

Router's Wireless Standard	802.11n 2.4GHz	802.11n 5GHz	802.11ac 5GHz					
	Download and install th	ne latest WLAN driver fi	rom <u>MSI</u> or <u>Intel</u>					
WLAN driver update	official website.							
Router firmware update	Check if there is new firmware update for your router.							
	Set the power plan to "	'high performance" and	I makes sure the					
Power saving settings	wireless adapter's pow	er saving mode is set to	o "maximum					
	performance".							
Advanced settings: U-APSD		Disabled						
<u>support</u>		Disabled						
Advanced settings: Transmit		5 Highest						
<u>Power</u>	J. Highest							
Data encryption protocol of								
<u>the router</u>	WPAZ-AES							
	According to the "WifiInfoView" program, choose the least							
	overlapping area which	i can reduce the signal i	nterference.					
<u>Wireless Mode</u>		802.11a/b/g						
Preferred Band	Prefer 2.4GHz band	Prefer 5.2GHz band	Prefer 5.2GHz band					
<u>HT Mode</u>	HT Mode	VHT Mode	VHT Mode					
802.11n Channel Width for	201411- Ophy or Auto	Auto	Auto					
<u>2.4GHz</u>	20101HZ Only of Auto	Auto	Auto					
	If there is no Bluetooth devices need to connect with, then it's							
Bluetooth function	recommended to turn OFF the Bluetooth function in SCM control							
	panel.							
Roaming Aggressiveness		1. Lowest						
Ad Hoc QoS Mode		WMM Disabled						



Killer 802.11 AC WLAN Adapter

Router's Wireless Standard and the Wireless Band	802.11n 2.4GHz	802.11n 5GHz	802.11ac 5GHz			
WLAN driver update	Download and install th website.	ne latest WLAN driver fi	rom <u>MSI</u> official			
<u>Router firmware update</u>	Check if there is new firmware update for your router.					
Power saving settings	Set the power plan to " wireless adapter's pow performance".	'high performance" and er saving mode is set to	l makes sure the o "maximum			
Data encryption protocol of the router	WPA2-AES					
WLAN Channel	According to the "Wifil overlapping area which	nfoView" program, cho a can reduce the signal i	ose the least interference.			
Bluetooth function	If there is no Bluetooth recommended to turn panel.	devices need to conne OFF the Bluetooth func	ct with, then it's tion in SCM control			
Roaming Aggressiveness		1. Lowest				



I. WLAN Adapter Driver & Router Firmware Update

The WLAN adapter driver and the router fimware update may be helpful for impoving the compatibility between the WLAN adapter and some certain router (*more details*), stability and the performance of the Wireless connection.

- 1. Download and install the latest WLAN driver from <u>MSI</u> official website.
 - Intel: <u>https://downloadcenter.intel.com/default.aspx</u>
- 2. Check if there is new firmware update for your router.

II. Disable the Power Saving Functions

To turn off the power saving related functions can prevant unexpected disconnecting, sudden connection speed drops issues and keep the WLAN adapter working at its maximum performance.

1. Set the power saving settings:

Go to "Control Panel" >> "Hardware and Sound" >> "Power Options" >> Set the "High performance" and apply to default settings. (Check the "Change plan settings">> "Change advanced power settings">> Wireless adapter settings>> Power Saving Mode and make sure both "On battery" and "Plugged in" are set to "Maximum Performance".)

@	Step 1	Edit Pla	it Plan Settings – 🗖	×
€ ∋	 ↑ 1 	Control Panel	ngs v C Search Control Panel	Q
		Change settings for the plan: High perfo Choose the sleep and display settings that you want Turn off the display: Turn off the display: Put the computer to sleep: Put the computer to sleep: Main and the settings Step 2 Change advanced power settings Restore default settings for this plan	erformance wat your computer to use. On battery Image: Select the power Options ? Image: Select the power plan that you want to customize, and the choose settings that reflect how you want your computer to manage power. Image: Select the power plan that you want to customize, and the choose settings that are currently unavailable Image: Select the power plan that you want to customize, and the choose settings that are currently unavailable Image: Select the power plan that you want to customize, and the choose settings that are currently unavailable Image: Select the power plan that you want to customize, and the performance Image: Select the power plan that you want to customize, and the choose settings that are currently unavailable Image: Select the power plan that you want to customize, and the performance Image: Select the power settings Image: Power Saving Mode Ok Image: Settings Image: USR settings Image: Settings <th></th>	



2. Set the advanced settings of WLAN adapter:

Intel 802.11 AC WLAN Adapter

Right click on Windows icon and choose "Device Manager" >> "Network adapters" >> "Intel® Dual Band Wireless-AC 7260 / AC 3160", and right-click and select "Properties".

	benee manager	
	File Action View Help	
Programs and Features	 ▲ MSI ▷ ▲ Audio inputs and outputs ▷ ▲ Batteries ▷ Bluetooth ▷ ▲ Computer 	
Power Options Event Viewer System Step 1	 Disk drives Display adapters QVD/CD-ROM drives Firmware 	
Device Manager	> 🕼 Human Interface Devices	
Network Connections Disk Management Computer Management Command Prompt Command Prompt (Admin) Task Manager Control Panel File Explorer	 Imaging devices Ima	
Search Run	Print queues Disable Dissors Uninstall	
Shut down or sign out Desktop	▷ ① Software devices Scan for hardware changes ▷ ◀ Sound, video and game controllers Properties	

- Select "Advanced" page to set the value of "U-APSD support" to "Disabled". (Find more details about U-APSD <u>here</u>)
- Check the value of "Transmit Power" and make sure it's set to "5. Highest".

Intel(R) E	Jual Band Wireles	s-AC 3160 Pr	operties ×		Intel(R) D	Jual Band Wireles	s-AC 3160 Pro	operties ×
Events	Resources	Resources Power Management			Events	Resources	Power N	lanagement
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		OK	Cancel				ОК	Cancel



Killer 802.11 AC WLAN Adapter

Right click on Windows icon and choose "Device Manager" >> "Network adapters" >> "Killer Wireless-n/a/ac 1525 Wireless Network Adapter", and right-click and select "Properties".

File Action View Help Image: Step 1 Image: Step 1 Device Manager Image: Step 1 Disk Management Image: Step 1 Computer Management Image: Step 1 Command Prompt Image: Step 1 Image: I		🚔 Device Manager – 🗖
Programs and Features Image: Imag		File Action View Help
Programs and Features Addio inputs and outputs Mobility Center Addio inputs and outputs Power Options Disk drives Event Viewer Disblay adapters System Step 1 Device Manager Memory technology devices Network Connections Memory technology devices Disk Management Memory technology devices Computer Management Memory technology devices Command Prompt (Admin) Metwork adapters Task Manager Network adapters Control Panel Processors Search Sound, video and game controllers Search System devices Studiown or sign out System devices		
	Programs and Features Mobility Center Power Options Event Viewer System Step 1 Device Manager Network Connections Disk Management Computer Management Computer Management Command Prompt Command Prompt Common Comment Command Prompt Command Prompt Command Prompt Command Prompt Command Prompt Command Prompt Common Comment Sature Sature Sature Shut down or sign out	→ Audio inputs and outputs → Batteries → Buetooth → Computer → Disk drives → Display adapters → Display adapters → Human Interface Devices → Monitors → Riller 2200 Grapht Ethemet Controller (NDIS 6.30) → Riller 2200 Grapht Ethemet Controller (NDIS 6.30)

III. Optimize the Wireless Network

Find the optimized wireless connection settings between the WLAN adapter and the router. By choosing the settings which suits the network environment and the router, you can have a better connection quality and more stable connection.

- MSI recommands 5GHz channel with 5GHz router to have a better wireless connection performance. (*Find more details about improving 802.11n connectivity <u>here</u>)*
- Setup WPA2-AES encryption for your router. (Find more details about WPA2-AES encryption <u>here</u>)

For example, I'm using a GE60 2PE (with Intel AC 3160 WLAN) to connect with a 802.11b/g/n router (supports both 2.4GHz and 5.2GHz) and by using the "WifiInfoView" program, it shows the wireless connection enviornment around (It shows the band and the channel every routers/wireless devices are using).

Johnsonche	38-AA-3C-E2-E3-37	802.11n	-63	61	60.7		2.437	6	171	15	SAMSUNG ELECTRO-M			WPA2-PSK	CCMP	72 Mbj
atf ken_3G	66-B4-73-42-4F-6C	802.11n	-79	35	42.3		2.412	1	198	12			Android_d830	WPA2-PSK	CCMP	72 Mbj
at kuanlin	D2-E7-82-75-17-31	802.11n	-73	45	47.3		2.437	6	186	12				WPA2-PSK	CCMP	72 Mbj
	00-D0-41-C9-AF-2E	802.11g	-70	50	51.8 B	and	2.432	5	97	10	AMIGO TECHNOLOGY			WEP	WEP	54 Mbj
NB-TAS	00-22-80-82-6D-4E								370		D-Link Corporation	DIR-628	Wireless N Dualband Router	WPA-PSK + W	TKIP+CCMP	130 MI
MINB_HW_OEM	AC-81-12-85-5E-5F	802.11g	-71	48	47.3		2.452	9	Chashel	7	Gemtek Technology Co			WPA2-PSK	CCMP	54 Mb
will NoteAP	5C-0A-5B-FD-F6-95	802.11n	-81	31	31.0		2.437	6	Channier 144	11	SAMSUNG ELECTRO-M			WPA2-PSK	CCMP	72 Mbj
PadFone-33	5C-FF-35-7E-5D-6C	802.11n	-75	41	37.6		2.437	6	179	11	Wistron Corporation			WPA2-PSK	CCMP	72 Mbj
at Pinky	20-10-7A-10-DB-6F	802.11g	-68	53	55.8		2.412	1	35	6	Gemtek Technology Co			WEP	WEP	54 Mbj
⊿t SysDiagTest	CA-D3-A3-6C-0F-5B	802.11n	-68	53	59.9		2.447	8	208	17				WPA2-PSK	TKIP+CCMP	300 Mł
atl test-123	AC-81-12-85-5B-1F	802.11g	-72	46	48.5		2.412	1	60	7	Gemtek Technology Co			WPA2-PSK	TKIP	54 Mbj
will TEST123456	AC-81-12-85-5C-C5	802.11g	-79	35	35.9		2.437	6	94	8	Gemtek Technology Co			WPA-PSK + W	TKIP+CCMP	54 Mbj
atl TestN	C8-D3-A3-38-6B-74	802.11n	-76	40	38.0		2.422	3	333	15	D-Link International	D-Link Router	DIR-865L	WPA-PSK + W	TKIP+CCMP	216 MI 🗸

Choose and set the band and the channel for the wireless connection for your router and the WLAN adapter. Choose 2.4GHz (Choose the 5.2GHz band under normal condition, we choose 2.4GHz



band since my mobile phone, tablet and other devices which only support the 2.4GHz band) and the channel 11. (According to the wireless connection environment around, we choose the channel 11 because it has the least overlapping area which can reduce the signal interference)

PS: Despite the 2.4GHz band has better penetration capabilities, you should choose the optimized setting for you wireless connection environment. (If there are walls or other solid objects blocking between the router and the notebook, using the 2.4GHz can be a better choice.)

Next, change the WLAN adapter's advanced settings in order to match the settings with the router. (Only for Intel 802.11 AC WLAN Adapter)

• Set the "Wireless Mode" to "802.11 a/b/g". (Choose the wireless mode according to the support mode of your router)

Intel(R) D	ual Band Wirele	ss-AC 3160 Pro	operties ×
Events	Resources Advanced	Power M	Management Details
The following prop the property you w on the right. Property:	erties are available fo ant to change on the	r this network adapt left, and then select Value:	ter. Click t its value
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		ОК	Cancel



• Set the "Preferred Band" to "Prefer 2.4GHz band".

Intel(R) D	ual Band Wireless	s-AC 3160 Pro	perties ×
Events	Resources	Power Ma	anagement
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The following prop the property you w on the right.	erties are available for t ant to change on the le	his network adapte ft, and then select	er. Click its value
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		ОК	Cancel

• Set the "HT Mode" to "HT Mode" for 802.11n compatibility.

(VHT Mode is for 802.11ac compatibility)

Intel(R) D	oual Band Wirele	ss-AC 3160 Pro	operties ×
Events	Resources	Power N	lanagement
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The following prop the property you w on the right.	erties are available fo vant to change on the	or this network adapt left, and then selec	ter. Click t its value
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		ОК	Cancel



Set the "802.11n Channel Width for 2.4GHz" to limited "20MHz".
 PS: 20MHz has smaller bandwidth than 40MHz, but it has better penetration capabilities which improves the connection signal.

Events	Resources	Power N	lanagement
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The following prop the property you wonthe property: 802 Tin Channel 802 Tin Channel 802 Tin Channel 802 Tin Channel 804 Hoc Channel 804 Hoc Channel 804 Hoc Annel 804 Keying for GTK rekying for GTK rekying for Mixed Mode Prot NS offload for W Preferred Band Roaming Aggress Sleep on WoWL	Width for 2.4GH2 Width for 2.4GH2 Width for 5.2GH: Width for 5.2GH: WOULAN P erant WoWLAN ection oWLAN siveness AN Disconnect	his network adapt ft, and then select Value: Auto 20 MH2 Ont Auto	er. Click i its value

IV. Other WLAN Adapter Settings

Furthermore, if there is no Bluetooth devices need to connect with, then it's recommended to turn OFF the Bluetooth function in SCM control panel. The wireless and bluetooth combo card share the same bandwidth and the antenna, so by turning off the bluetooth function can let the wireless connection has the entire usage of bandwidth and the antenna. if choosing 2.4GHz band, then turnning off the Bluetooth can also decrease the signal interference since Bluetooth devices use the same band.

PS: Except the Bluetooth devices, a working microwave will cause the signal interference of the wireless connection (microwave is also also using 2.45GHz band). Thus, to keep the microware away from the router and the notebook can give you a better connection quality.

R	System Control Manager 🗃										
	Wi-Fi Webcam	OFF Bluetooth	Rightness	> 0 >	<	Movie Presentation Game Office	Display Off				
						ECO off					



Lastly, set up the properties below can improve the quality of the wireless connection.

• Set the value of "Roaming Aggressiveness" to "Lowest ".

Intel 802.11 AC WLAN Adapter

Intel(R) [Dual Band Wireles	s-AC 3160 Pro	perties ×			
Events	Resources	Power M	Power Management			
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The following properties are available for this network adapter. Click the property you want to change on the left, and then select its value on the right.						
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Killer 802.11 AC WLAN Adapter

Killer Wireless-n/a/ac 1525 Wireless Network Adapter ×						
Events	Resources	Power N	Power Management			
General	Advanced	Driver	Details			
The following properties are available for this network adapter. Click the property you want to change on the left, and then select its value on the right.						
Property:		Value:				
D0 PacketCoalescing		1.Lowest	•			
Dynamic MIMU P	ower Save					
Roaming aggressi	veness					
,						
		OK	Cancel			



• Set the value of "Ad Hoc QoS Mode" to "WMM Disabled". (Only for Intel

802.11 AC WLAN Adapter)

Intel(R) D	ual Band Wireles	s-AC 3160 Pro	perties ×
Intel(R) D Events General The following prop the property you w on the right. Property: 802.11n Channel 802.11n Channel 802.11n Channel Ad Hoc Clos Moo AHP offload for W Bluetooth(R) AM Fat Channel Intol GTK rekeying for HT Mode Mixed Mode Prot NS offload for WV Preferred Band Roaming Aggress Sleep on WoWL	Advanced Resources Advanced erties are available for ant to change on the le Width for 2.4GH: A Width for 5.2GH: 002.11b/g erant YoWLAN Serant WoWLAN ection WUAN weness AN Disconnect	s-AC 3160 Pro	Anagement Details er. Click its value
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