

List of FCC Questions

AP-7161 (FCC ID QJEAP7161-01,-02)

Question 1)

Does this device meet the requirements for operation in the 5400-5725 MHz band specified in KDB 443999?

For reference, KDB KDB443999 (Oct. 2010) lists the following requirements for operation in the 5400-5725 MHz band:

- a. Devices will not transmit on channels which overlap the 5600-5650 MHz band.
- b. Additional restrictions for outdoor devices:
 - i. Must be professionally installed if operated in 5470-5725 MHz band.
 - ii. Instructions on requirements for avoiding TDWR interference must be provided.
 1. 30 MHz separation if located within 35 km of a TDWR.
 2. Registration procedure for industry-sponsored database.
- c. Devices must meet all 15.407 requirements, and configuration controls for non-granted frequencies are prohibited.

Response 1) (Motorola Solutions responses in blue).

a. Devices will not transmit on channels which overlap the 5600-5650 MHz band. - Channels 120 thru 132 (5600, 5620, 5640 and 5660 MHz) are disabled (not included in selection list) in the device configuration GUI. A screenshot of the GUI's channel selection list is shown in Figure 1a-1 below. The closest channels available for selection are 116 and 136 (5580 and 5680 MHz, respectively). A spectrum analyzer plot in Figure 1a-2 below from Attachment 1 (MET Laboratories Test report EMC30461-FCC407) shows a 20 dB bandwidth of less than 20 MHz on channel 116, demonstrating that no overlap occurs with the 5600-5650 MHz band when channel 116 is selected. Similar occupied bandwidth is exhibited when channel 136 is selected. A bandwidth plot of channel 140 (from the same attached test report) is included in Figure 1a-3. The channel 140 plot is provided here as representative of channel 136.

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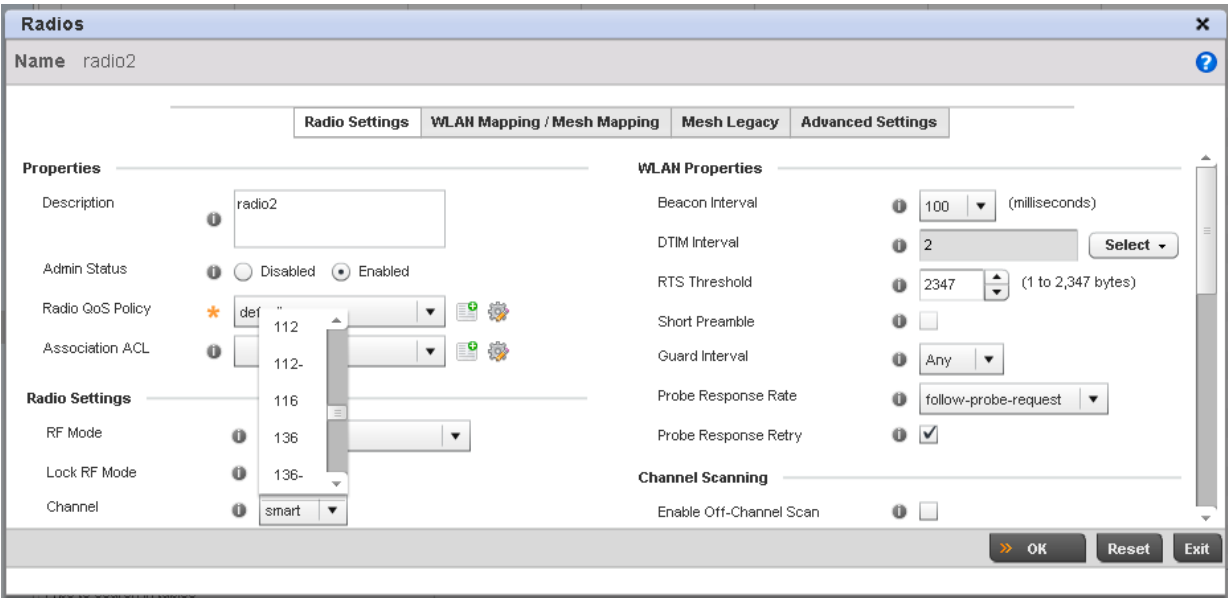


Figure 1a-1 - AP7161 Configuration GUI screenshot showing the channel selection list for the 5 GHz radio.

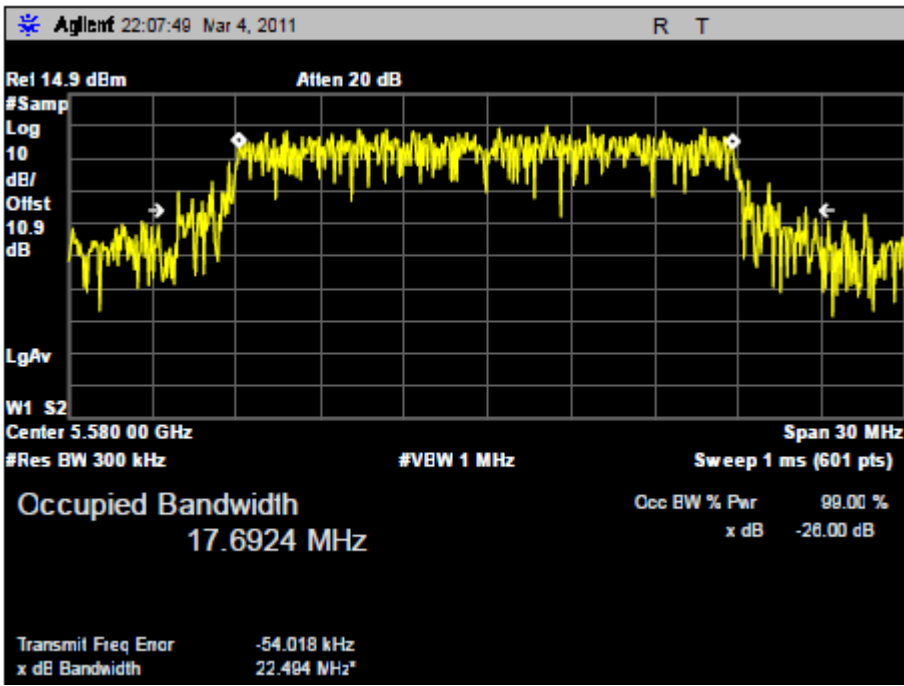


Figure 1a-2 - Spectrum analyzer plot showing Channel 116 occupied bandwidth of < 20 MHz

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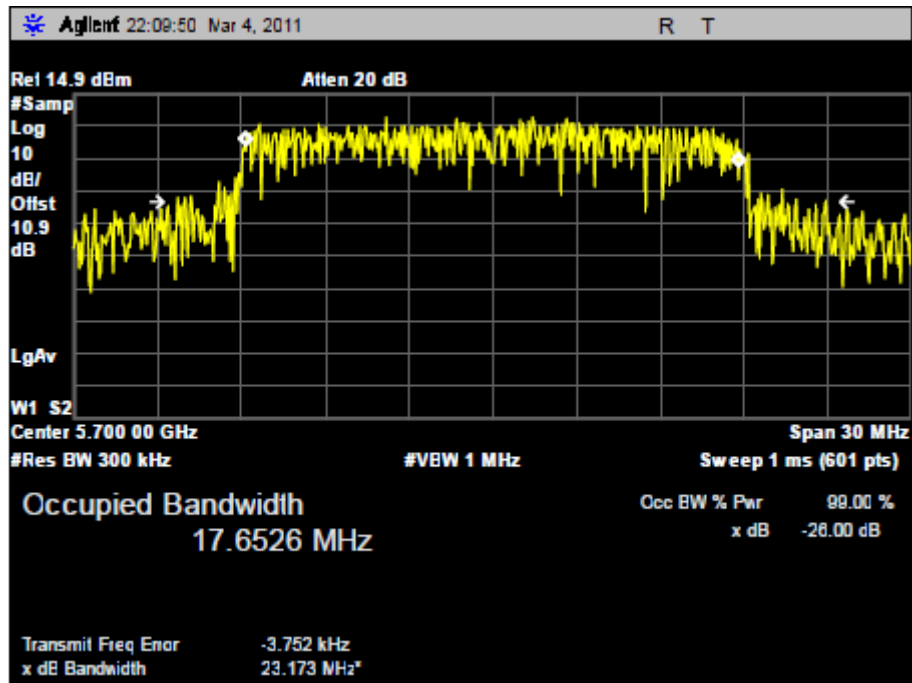


Figure 1a-3 - Spectrum analyzer plot showing Channel 140 occupied bandwidth of < 20 MHz

b. Additional restrictions for outdoor devices.

i. Must be professionally installed if operated in 5470-5725 MHz band. - Motorola Solutions requires all resellers and installers to complete product-specific training courses and achieve testing-based certifications as a condition of sale of wireless networking equipment. A detailed description of the testing and certification program is given in response to Question #7 of this inquiry.

ii. Instructions on requirements for avoiding TDWR interference must be provided.

1. 30 MHz separation if located within 35 km of a TDWR. - The text of KDB443999 is provided in its entirety in an Installation Guide provided to all installers. An explanation of how to configure the device to ensure compliance is given in Response #8.

2. Registration procedure for industry-sponsored database. - This information is provided in the KDB text (Page 2, footnote 6) reproduced in the Installation Guide noted above.

c. Devices must meet all 15.407 requirements, and configuration controls for non-granted frequencies are prohibited. - The US model of the device will have only one country code, "us", available for selection in the configuration GUI as shown in Figure 1c-1 below.

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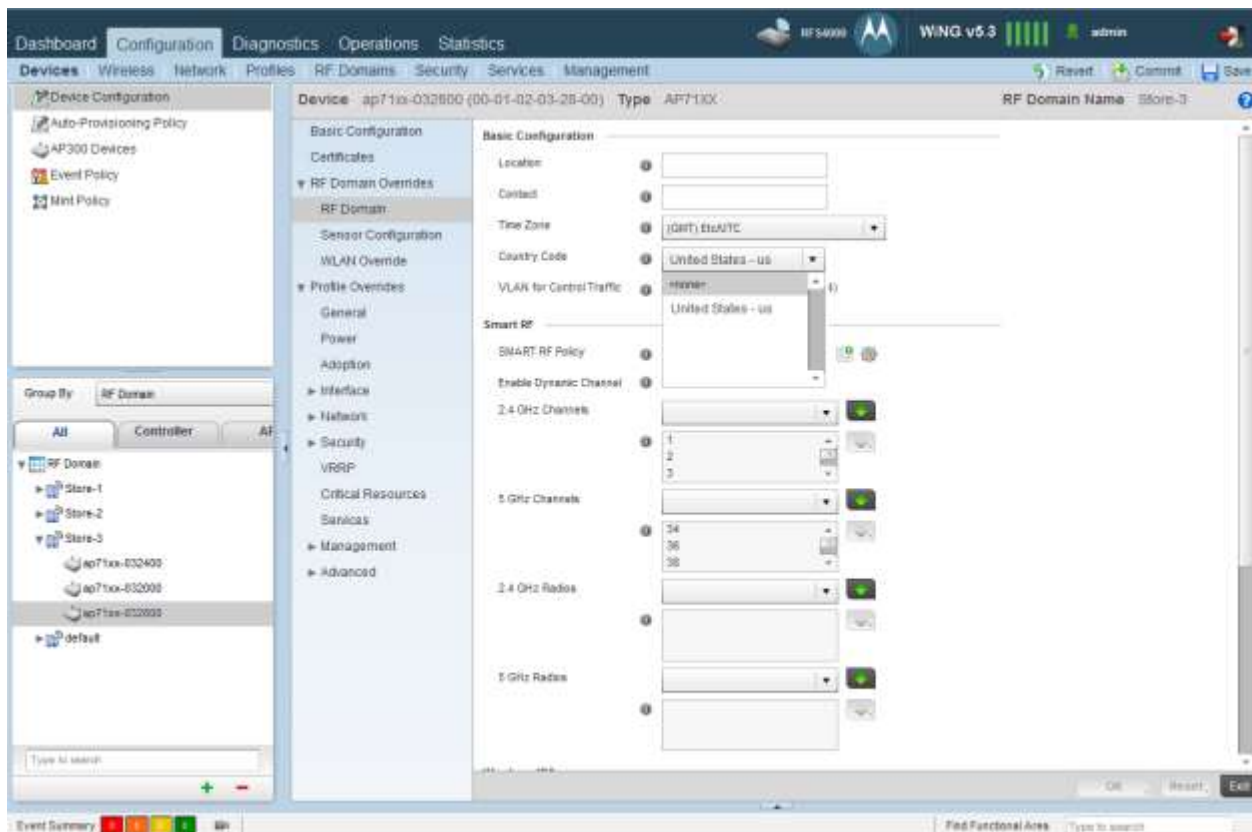


Figure 1c-1 - AP7161 Configuration GUI showing the US-only country code selection list.

Question 2)

Is this an indoor device, outdoor device, or multi-use device? A multi-use device can operate in both indoor and outdoor configurations; such device will have to meet all the requirements for outdoor device.

Response 2)

Motorola response - This is a multi-use device that meets all outdoor device requirements specified in KDB 443999 (Oct 2010) as explained in Response 1.b above.

Question 3)

Verify that the 5600 - 5650 MHz band is notched. The test report should include 20 dB BW plots for the 5600 and 5650 MHz band edges and an attestation statement that the device does not transmit in the notched band.

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Response 3)

Motorola response - Motorola Solutions confirms that the device will not transmit in the notched 5600-5650 MHz band. The closest available channels allowed by firmware are 116 and 136 as described in Response 1a above. Twenty dB BW plots of channels 116 and 140 (Figures 1a-2, 1a-3) from the attached test report show bandwidths of < 20 MHz. Channel 140 is referenced here as representative of channel 136.

Question 4)

Verify that this application contains a complete User's Manual and/or a Professional Installer's Manual. If the manual is not complete, upload an updated User's Manual exhibit.

Response 4)

Motorola response - An updated Installation Guide exhibit has been uploaded.

Question 5)

Verify that this device meets the uniform channel spreading requirements on the remaining (non-notched) channels once the device is in operation.

Response 5)

Motorola response - The AP7161 firmware supports two modes of automatic channel selection: 1) Random and 2) Smart-RF. In Random channel selection mode, the firmware chooses a random channel from a list of supported channels in the configured domain and country. In Smart-RF mode, the AP listens and records the amount of traffic on all channels supported in the configured regulatory domain and country. From the information collected, the firmware chooses the least congested channel. The Smart-RF algorithm can be run periodically to ensure uniform channel loading across all channels over a period of time.

Question 6)

Explain how this device meets the Software Configuration Control requirements of KDB 594280 including country code selection.

Response 6)

Motorola response - The General Requirements of KDB594280 are met by Motorola's WiNG5[®] operational software installed on the AP7161. The WiNG5[®]

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software is completely controlled by Motorola Solutions and is not modifiable by any third party. The operational software on AP7161 SKUs sold in the US defaults to the "us" country code, which cannot be changed (see Response 1c and Figure 1c-1 above). The software exposes the following radio configuration parameters to professional installers:

- Channel
- Transmit Power
- Modulation Mode
- Number of transmit and receive antennas
- Antenna type

Available values or selections for each parameter are limited to configurations allowed by the grant authorization.

Question 7)

Submit a Letter Exhibit identifying the specific expertise and the training required by the professional installers for installing these types of devices.

Response 7)

Motorola response - Two document exhibits attached (Attachments 2 and 3). Summary of major points is as follows:

Motorola Solutions requires all Channel Partners (resellers and professional installers) to complete training and achieve certifications in a partner program as a condition of sale of Motorola Solutions products. The program, PartnerEmpower™, includes training and certifications for products from all Motorola Solutions business units, including the Wireless Network Solutions (WNS) unit that manufactures and markets the AP7161. Training requirements are specific to individual products, and are classified by Product Access Codes. Purchase of the AP 7161 requires training and certification to Product Access Code 4. Class 4 products require deep technical knowledge of product-specific features, configuration and deployment considerations, and a technical understanding of how the product integrates into both Motorola and non-Motorola environments. The training and certification testing is designed to ensure that channel partners deploy and support these products for regulatory compliance and optimal performance in operation. The Channel Partner access controls associated with each Product Access Code are shown in Figure 7-1 below. Attachments 2 and 3 ("WNS Training and Certification Overview 7-25-11.pdf" and "WNS Outdoor Curriculum Matrix 6-08-11.pdf") describe in detail the PartnerEmpower™ program.

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Partner Empower Product Access Codes						
	Open Reseller	PartnerEmpower Program Members				
	Code 1	Code 2	Code 3	Code 4	Code 5	Code 6
Product Access	Open Product <i>All resellers have access</i>	Authorized Products	Authorized Products Requiring Reseller Value-Add	Authorized Products Requiring Training	Reserved Products	Limited Products
Description	Available to PartnerEmpower resellers as well as those not in PartnerEmpower Mature, plug-and-play products that are ready for market and require very little value-add from resellers	Available to any Partner Empower member Mature products that require little value-add from Motorola resellers and can be sold successfully both face-to-face and through low-touch methods such as internet catalogs.	Available to any Partner Empower member Products that require value-added expertise from Motorola resellers and that, as a result benefit from face-to-face sales engagements.	Available to any Partner Empower member More technically complex products that require significant value-added expertise from Motorola resellers during face-to-face sales engagements.	Reserved for select Partner Empower members Differentiated products that are available only to a resellers with Motorola approval, based on specific business and technical criteria.	Available to Partner Empower members by invitation only Highly specialized, custom products that are available only to specific, approved Motorola resellers, based on product-specific criteria.
Access Controls	<ul style="list-style-type: none"> No Controls (Resale/Tax Exempt Certificate Required) 	<ul style="list-style-type: none"> Must be a Member Partner Additional Training May be Available for select products 	<ul style="list-style-type: none"> Must be a Member Partner Additional Training May be Available for select products Face to Face selling requirement 	<ul style="list-style-type: none"> Must be a Member Partner Partner must complete individual Product Specific Access Requirements Additional Training May be Available for select products Face to Face selling requirement 	<ul style="list-style-type: none"> Must be a Member Partner Must be approved for Product Specific Access Additional Certification and Training may be Required Must meet non-Motorola certification requirements if applicable Based on Motorola Business needs 	<ul style="list-style-type: none"> Must be a Member Partner Must be approved for Product Specific Access Additional Certification and Training may be Required Must meet non-Motorola certification requirements if applicable By Invitation Only

Figure 7-1 - Access requirement summary for professional installers of WNS products.

Question 8)

Explain how this device can meet the 30 MHz frequency separation from TDWR (i.e.: Manually blocking frequencies by the professional installer, device notches 5470 -5680 MHz, etc.)

Response 8)

Motorola response - There are two mechanisms available in the device configuration software to block frequencies (in addition to the always-blocked 5600-5650 MHz band). Either may be used by the professional installer to enforce TDWR avoidance and maintain the minimum 30 MHz frequency separation. The first mechanism is manual channel assignment, in which case the installer would explicitly set an operational channel outside the DFS bands in another band certified for operation (the AP7161 has been granted certification for operation in the 5725-5825 MHz U-NII band). The second mechanism is provided by a proprietary "Smart-RE" algorithm that maintains an installer-defined list of permitted channels, in which case all DFS channels would be removed from the permitted channel list. In either case, operation on any DFS channel would be prevented.

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Question 9)

Does the manual for the installers and operators contain the information on how to register the device with the voluntary industry data base if operating within 35 km of any TDWR site location?

Response 9)

Motorola response - The Installation Guide provides the following information on, and instructions for registration with the voluntary industry data base:

A voluntary WISPA sponsored database has been developed that allows operators and installers to register the location information of the UNII devices operating outdoors in the 5470 – 5725 MHz band within 35 km of any TDWR location (see <http://www.spectrumbridge.com/udia/home.aspx>). This database may be used by government agencies in order to expedite resolution of any interference to TDWRs.