

Chris Harvey

From: Jennifer Sanchez [jsanchez@metlabs.com]
Sent: Thursday, July 16, 2009 3:42 PM
To: Chris Harvey
Cc: Shawn McMillen; Jenn Warnell; Jennifer Sanchez
Subject: RE: User Manual for the M5 for Ubiquiti, MT# 85109
Attachments: EMCS81509B-FCC247_Rev3.pdf; user guide_Rev4.pdf

Hi Chris,
Please see comments in blue.

It appears that the only change to the 162 page report was the addition of a statement on page 55 of 150 that states:

"Note: for the MIMO mode both antenna ports were connected to the cross polarized antenna inputs although no test setup photos were given."

Although this is not stated in the report, I have assumed that by indicating that both ports are connected, you have implied that both Ports A & B of the EUT were connected to both ports of the 30dBi Dual-Polarity Dish antenna, the 24dBi Dual-Polarity Panel Antenna, and the 20dBi Dual-Polarity Sector antenna, respectively. Please confirm that this assumption is correct.
This assumption is correct.

Please note that the test setup diagram on page 6 of 150 does not have port B of the EUT connected to any of the Dual-Polarity antennas listed above. Also, please note that the 30dBi Dual-Polarity Dish antenna is not listed in the support equipment list on page 7 of 150.
The report has been updated, please see attached.

Also, the Users Manual wording must be modified to clearly indicate that this device is required to be professionally installed, and that the operation is restricted to Point-to-Point operations for any antennas other with gains greater than 7 dBi. The current wording is not clear. The wording required by FCC 15.21 is still missing. Please update the manual accordingly.
The manual has been updated, please see attached.

Thanks!
J. Sanchez
TCB Administrator
MET Laboratories, Santa Clara CA
408-207-4785 Office
408-829-1603 Cell
jsanchez@metlabs.com



From: Chris Harvey [mailto:charveyemc@gmail.com] On Behalf Of Chris Harvey
Sent: Wednesday, July 15, 2009 9:47 AM
To: Jennifer Sanchez
Cc: Shawn McMillen; Jenn Warnell
Subject: RE: User Manual for the M5 for Ubiquiti, MT# 85109

7/17/2009

J-San,

It appears that the only change to the 162 page report was the addition of a statement on page 55 of 150 that states: "Note: for the MIMO mode both antenna ports were connected to the cross polarized antenna inputs although no test setup photos were given."

Although this is not stated in the report, I have assumed that by indicating that both ports are connected, you have implied that both Ports A & B of the EUT were connected to both ports of the 30dBi Dual-Polarity Dish antenna, the 24dBi Dual-Polarity Panel Antenna, and the 20dBi Dual-Polarity Sector antenna, respectively. Please confirm that this assumption is correct. [This assumption is correct.](#)

Please note that the test setup diagram on page 6 of 150 does not have port B of the EUT connected to any of the Dual-Polarity antennas listed above. Also, please note that the 30dBi Dual-Polarity Dish antenna is not listed in the support equipment list on page 7 of 150.

Also, the Users Manual wording must be modified to clearly indicate that this device is required to be professionally installed, and that the operation is restricted to Point-to-Point operations for any antennas other with gains greater than 7 dBi. The current wording is not clear. The wording required by FCC 15.21 is still missing. Please update the manual accordingly.

Best regards,

Chris Harvey
charvey@ieee.org
410-750-0860

From: Jennifer Sanchez [mailto:jsanchez@metlabs.com]
Sent: Tuesday, July 14, 2009 5:35 PM
To: Chris Harvey
Cc: Shawn McMillen; Jennifer Sanchez; Jenn Warnell
Subject: RE: User Manual for the M5 for Ubiquiti, MT# 85109
Importance: High

Hi Chris,

Please find attached the revised report as requested.

If you have any questions, please let me know.

Thanks!

J. Sanchez
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MET Laboratories, Santa Clara CA
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jsanchez@metlabs.com



From: Chris Harvey [mailto:charveyemc@gmail.com] On Behalf Of Chris Harvey
Sent: Tuesday, July 14, 2009 11:57 AM
To: Shawn McMillen; Jennifer Sanchez
Subject: RE: User Manual for the M5 for Ubiquiti, MT# 85109

Shawn, thank you for the confirmation. Jsan, please have the test report updated to reflect this test configuration description.

I WILL AWAIT THE REVISED REPORT AND REVISED MANUAL.

Best regards,

Chris Harvey
charvey@ieee.org
410-750-0860

From: Shawn McMillen [mailto:SMcMillen@metlabs.com]
Sent: Tuesday, July 14, 2009 1:36 PM
To: Chris Harvey
Cc: Jennifer Sanchez
Subject: RE: User Manual for the M5 for Ubiquiti, MT# 85109

It appears that both antenna ports were connected for MIMO mode operation (802.11/n) but the pictures submitted in the report were for 802.11/a mode only. As it turns out the 802.11/a mode produced the highest spurious emissions.

Regards,

Shawn McMillen

Wireless Manager
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From: Chris Harvey [mailto:charveyemc@gmail.com] On Behalf Of Chris Harvey
Sent: Tuesday, July 14, 2009 1:32 PM
To: Shawn McMillen
Subject: RE: User Manual for the M5 for Ubiquiti, MT# 85109

Shawn, I understand your interpretation for the fundamental emission since the full antenna characteristics are documented at those frequencies, but the test in consideration here is the Radiated Spurious emissions test across a vast spectrum where you know not the full antenna characteristics. Please obtain an FCC interpretation that indicates that for all but the 7dBi omnidirectional antenna the FCC will accept only one of the MIMO ports connected for the Radiated Spurious Emissions test.

In the future please do a better job of describing your interpretations and test configurations in the test report.

Best regards,

7/17/2009

Chris Harvey
charvey@ieee.org
410-750-0860

From: Shawn McMillen [<mailto:SMcMillen@metlabs.com>]
Sent: Tuesday, July 14, 2009 1:27 PM
To: Chris Harvey
Subject: Re: User Manual for the M5 for Ubiquiti, MT# 85109

Due to the cross polarization only one was. If the dual antenna elements were the the same polarization then they would have added, but in this case they don't contribute to each other and only one can be measured at any given time.

Shawn McMillen

On Jul 14, 2009, at 1:14 PM, "Chris Harvey" <charvey@ieee.org> wrote:

Shawn, in the Radiated Spurious emissions test, were both antenna ports connected and transmitting in the 2x2 MIMO mode into the highest gain of each antenna type?

Best regards,

Chris Harvey
charvey@ieee.org
410-750-0860

From: Shawn McMillen [<mailto:SMcMillen@metlabs.com>]
Sent: Tuesday, July 14, 2009 1:04 PM
To: Chris Harvey
Subject: RE: User Manual for the M5 for Ubiquiti, MT# 85109

Hi Chris. Our receiving antenna can only pick up one polarization at a time, it is not dual polarized. The leg that produced the highest EIRP was measured.

Regards,

Shawn McMillen

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<image001.jpg>

From: Chris Harvey [<mailto:charveyemc@gmail.com>] On Behalf Of Chris Harvey
Sent: Tuesday, July 14, 2009 12:58 PM
To: Jennifer Sanchez
Cc: Jenn Warnell; Shawn McMillen
Subject: RE: User Manual for the M5 for Ubiquiti, MT# 85109

The radiated emissions are to be performed using BOTH antennas of a 2x2 MIMO device for each antenna type. The response does not address this issue.

Best regards,

Chris Harvey
charvey@ieee.org
410-750-0860

From: Jennifer Sanchez [<mailto:jsanchez@metlabs.com>]
Sent: Tuesday, July 14, 2009 12:53 PM
To: Chris Harvey
Cc: Jenn Warnell; Jennifer Sanchez; Shawn McMillen
Subject: RE: User Manual for the M5 for Ubiquiti, MT# 85109

Hi Chris,

Regarding your last concern, please see below:

Additionally, this new list in the manual and the revised report seems to now indicate that the MIMO (2x2) mode of operation is intended for use with all antennas except for the 30dBi Grid antenna (AG-5G-30) (original report implied only 7dBi Omni for MIMO). The radiated emissions in MIMO mode only seem to be documented with the 7dBi omni antennas. The FCC requires that this highest gain of each antenna type be tested for Radiated Spurious emissions in each mode, but the report documents only Port 1 connected during the radiated emissions tests for the 30 dBi Dish, 24dBi Panel and 20dBi Sector antennas.

All three antennas have dual polarity inputs. The gain in each polarity is the same. The receiving antenna used to measure the field strength is a single polarization. The port chosen for radiated emissions was the one that produced the highest conducted power level.

I will send the revised manual for the professional installers once I receive from Ubiquiti.

Thanks!

J. Sanchez
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jsanchez@metlabs.com
<image002.jpg>

From: Chris Harvey [<mailto:charveyemc@gmail.com>] On Behalf Of Chris Harvey
Sent: Monday, July 13, 2009 9:07 AM
To: Jenn Warnell
Cc: Jennifer Sanchez
Subject: RE: User Manual for the M5 for Ubiquiti, MT# 85109

Jenn, thank you for the replacement manual that changed the term PtP and PtMP to become Point-to-point and Point-to-Multi-Point. This single change does not seem to meet the requirements of the previously stated requirements of FCC 15.247. Additionally, the previous request also addressed a possible issue with missing test data. Please ensure that you address all issues raised in the e-mail:

I have had a chance to review the replacement manual and am not sure how clear the instructions to the installers will be:

Please note that 15.247 (B)(4)(iii) states:

(iii) Fixed, point-to-point operation, as used in paragraphs (b)(3)(i) and (b)(3)(ii) of this section, excludes the use of point-to-multipoint systems, omnidirectional applications, and multiple co-located intentional radiators transmitting the same information. The operator of the spread spectrum intentional radiator or, if the equipment is professionally installed, the installer is responsible for ensuring that the system is used exclusively for fixed, point-to-point operations. The instruction manual furnished with the intentional radiator shall contain language in the installation instructions informing the operator and the installer of this responsibility.

The current manual states:

The device has been designed to operate with the antennas listed below and having a maximum gain of 30dBi. Antennas not included in this list or having a gain greater than 30dBi are strictly prohibited for use with this device. The required antenna impedance is 50 ohms

2x2 PtP Use

Ubiquiti RD-5G-30

Ubiquiti RP-5G-24

Ubiquiti AMS-5G-20

1x1 PtP Use

Ubiquiti AG-5G-30

2x2 PtMP Use

Ubiquiti O-5G-7

Please improve the wording that CLEARLY informs the PROFESSIONAL installers (be clear that this is restricted to professional installers) about the PINOT-TO-POINT (please don't use 'PtP') restrictions for certain antennas.

Additionally, this new list in the manual and the revised report seems to now indicate that the MIMO (2x2) mode of operation is intended for use with all antennas except for the 30dBi Grid antenna (AG-5G-30) (original report implied only 7dBi Omni for MIMO). The radiated emissions in MIMO mode only seem to be documented with the 7dBi omni antennas. The FCC requires that this highest gain of each antenna type be tested for Radiated Spurious emissions in each mode, but the report documents only Port 1 connected during the radiated emissions tests for the 30 dBi Dish, 24dBi Panel and 20dBi Sector antennas.

Also, please include the required statement of FCC 15.21 in the manual.

Best regards,

Chris Harvey

charvey@ieee.org

410-750-0860

From: Jenn Warnell [<mailto:jwarnell@metlabs.com>]

Sent: Monday, July 13, 2009 9:23 AM

To: Chris Harvey

Cc: Jenn Warnell; Jennifer Sanchez

Subject: User Manual for the M5 for Ubiquiti

Hi Chris,

Attached is the revised User Manual for Ubiquiti's M5 (MT# 81509). Please continue with your review.

Regards,

Jenn Warnell

TCB Administrator/Documentation

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<image003.jpg>