TESTING
CERT #803.01, 803.02, 803.05, 803.06

ADDENDUM TO BENTLY NEVADA LLC. TEST REPORT FC09-025

FOR THE

ESSENTIAL INSIGHT.MESH MANAGER GATEWAY, 185510-01 & 185511-01/179168-01

FCC PART 15 SUBPART C SECTIONS 15.207 & 15.247, RSS-210 ISSUE 7 AND RSS GEN ISSUE 2

TESTING

DATE OF ISSUE: SEPTEMBER 23, 2009

PREPARED FOR:

Bently Nevada LLC.
1631 Bently Parkway South
Minden, NV 89423

PREPARED BY:

Mary Ellen Clayton
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

W.O. No.: 88570

Date of test: February 3 - March 3, 2009

Report No.: FC09-025A

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ADMINISTRATIVE INFORMATION

DATE OF TEST: February 3 - March 3, 2009

DATE OF RECEIPT: February 3, 2009

REPRESENTATIVE: Lane Killion

MANUFACTURER:
Bently Nevada LLC.
1631 Bently Parkway South
Minden, NV 89423

TEST LOCATION:
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

TEST METHOD: ANSI C63.4 (2003), RSS-210 Issue 7 and RSS GEN Issue 2

PURPOSE OF TEST:
Original Report: To perform the testing of the Essential Insight.mesh Manager Gateway, 185510-01 & 185511-01/179168-01 with the requirements for FCC Part 15 Subpart C Sections 15.207 & 15.247 and RSS-210 devices.
Addendum A: To correct the bandwidth settings on the data sheets, to convert the power output to watts, and to provide 15.31(e) voltage variations data with no new testing.

APPROVALS

QUALITY ASSURANCE:

Steve Behm, Director of Engineering Services

TEST PERSONNEL:

Chuck Kendall

Chuck Kendall, Senior EMC Engineer / Senior EMC Consultant

Greg Johnson, EMC Engineer

Mike Wilkinson, Senior EMC Engineer/Lab Manager

SUMMARY OF RESULTS

Test	Specification/Method	Results
AC Conducted Emissions	FCC 15.207	Pass
Occupied Bandwidth	FCC 15.247(a) RSS-210	Pass
RF Power Output	FCC 15.247(b)	Pass
Antenna Conducted Spurious Emissions	FCC 15.247(d)	Pass
OATS Spurious Emissions	FCC 15.247(d)	Pass
Peak Power Spectral Density	FCC 15.247(e)	Pass
Site File No.	FCC 90477 IC 3082A-2	

CONDITIONS DURING TESTING

No modifications to the EUT were necessary during testing.

FCC 15.31(m) Number Of Channels
This device was tested on three channels.

FCC 15.33(a) Frequency Ranges Tested
15.207 Conducted Emissions: 150 kHz – 30 MHz
15.209 Radiated Emissions: 9 kHz – 25 GHz

EUT Operating Frequency
The EUT was operating in the 2400-2483.5 MHz frequency band.

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The customer declares the EUT tested by CKC Laboratories was representative of a production unit.

The following models have been tested by CKC Laboratories: **Essential Insight.mesh Gateway Manager, 185510-01 & 185511-01/179168-01**

Since the time of testing the manufacturer has chosen to use the following model names in their place. Any differences between the names does not affect their EMC characteristics and therefore meets the level of testing equivalent to the tested model name shown on the data sheets: **Essential Insight.mesh Manager Gateway, 185510-01 & 185511-01/179168-01**

EQUIPMENT UNDER TEST

Essential Insight. Mesh Manager Gateway (2 each)
Manuf: Bently Nevada LLC.
Model: 185510-01
Serial: 0-17-0D-00-00-2D-99 & 0-17-0D-00-00-30-C4

Essential Insight. Mesh Manager Gateway (2 each)
Manuf: Bently Nevada LLC.
Model: 185511-01/179168-01
Serial: 0-17-0D-00-00-2E-D9 & 0-17-0D-00-00-30-B6

DC Power Supply (2 each)
Manuf: Traco
Model: TSP090-224-BM
Serial: 20813126047 & 20813126391

Omni-Directional Antenna with 75' of Coax
Manuf: HyperLink
Model: HGB2406U
Serial: NA

Small Omni-Directional Antenna
Manuf: Laird/Areocomm
Model: 0600-00014
Serial: NA

PERIPHERAL DEVICES

The EUT was tested with the following peripheral device(s):

Remote Ethernet Hub
Manuf: Linksys
Model: 5 Port 10/100
Serial: R91304 7001587 EB1040

Remote Computer
Manuf: Dell
Model: DCNE
Serial: 4FN1YC1

Remote Monitor
Manuf: Dell
Model: 170817
Serial: CN-0K0789-732-AAQ

Remote LCD Monitor
Manuf: Dell
Model: 1708FPT
Serial: CN-OKU789-71618-732-AA4Q

MEASUREMENT UNCERTAINTIES

Uncertainty Value	Parameter
4.73 dB	Radiated Emissions
3.34 dB	Mains Conducted Emissions
3.30 dB	Disturbance Power

The reported measurement uncertainties are calculated based on the worst case of all laboratory environments from CKC Laboratories, Inc. test sites. Only those parameters which require estimation of measurement uncertainty are reported. The reported worst case measurement uncertainty is less than the maximum values derived in CISPR 16-4-2. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k=2. Compliance is deemed to occur provided measurements are below the specified limits.

REPORT OF EMISSIONS MEASUREMENTS

TESTING PARAMETERS

TEMPERATURE AND HUMIDITY DURING TESTING

The temperature during testing was within +15°C and + 35°C.
The relative humidity was between 20% and 75%.

The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. Cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the setup photographs. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables.

The emissions data was taken with a spectrum analyzer or receiver. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the table below. The corrected data was then compared to the applicable emission limits. Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in dBµV/m, the spectrum analyzer reading in dBµV was corrected by using the following formula. This reading was then compared to the applicable specification limit.

SAMPLE CALCULATIONS		
	Meter reading	(dBµV)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dBµV/m)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed were used to collect the emissions data. A spectrum analyzer or receiver was used for all measurements. The following table shows the measuring equipment bandwidth settings that were used in designated frequency bands. For testing emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used. When conducted emissions testing was performed, a 10 dB external attenuator was used with internal offset correction in the analyzer.

SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the emissions tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "Peak" mode. Whenever a "Quasi-Peak" or "Average" reading is listed as one of the highest readings, this is indicated as a "QP" or an "Ave" on the appropriate rows of the data sheets. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the spectrum analyzer/receiver readings recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature of the measuring device called "peak hold," the measuring device had the ability to measure transients or low duty cycle transient emission peak levels. In this mode the measuring device made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

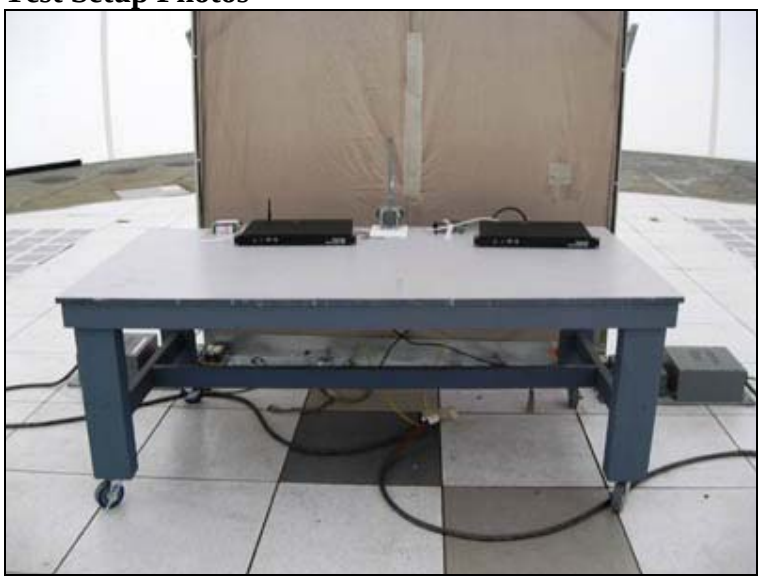
When the true peak values exceeded or were within 2 dB of the specification limit, quasi-peak measurements were taken using the quasi-peak detector.

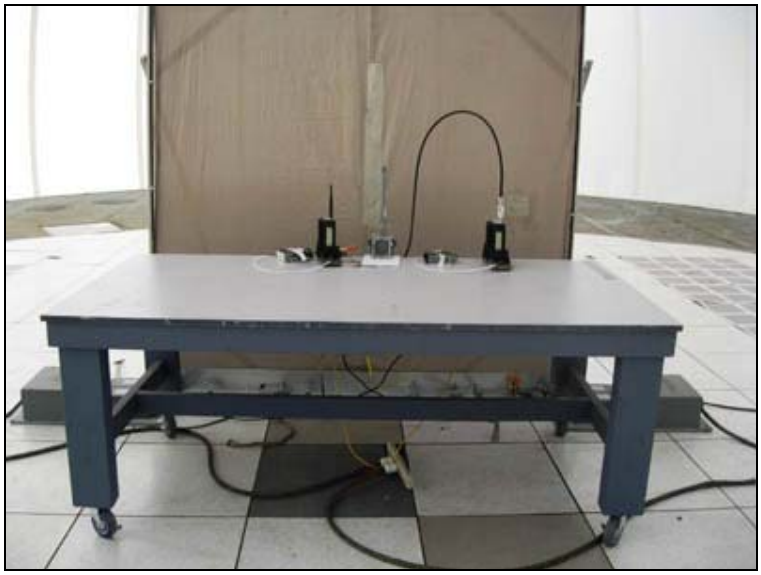
Average

For certain frequencies, average measurements may be made using the spectrum analyzer/receiver. To make these measurements, the test engineer reduces the video bandwidth on the measuring device until the modulation of the signal is filtered out. At this point the measuring device is set into the linear mode and the scan time is reduced.

FCC 15.207 – AC CONDUCTED EMISSIONS

Test Setup Photos





Test Data Sheets

Test Location: CKC Laboratories •5046 Sierra Pines Dr. • Mariposa, CA 95338 • 209 966-5240

Customer:	**Bently Nevada**		
Specification:	**FCC 15.207 - AVE**		
Work Order #:	**88570**	Date:	2/4/2009
Test Type:	**Conducted Emissions**	Time:	4:03:31 PM
Equipment:	**Essential Insight.mesh Gateway Manager**	Sequence#:	14
Manufacturer:	Bently Nevada LLC.	Tested By:	Chuck Kendall
Model:	185510-01		120V 60Hz
S/N:	0-17-0D-00-00-30-C4		

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8593EM Spectrum Analyzer	3624A00159	03/23/2007	03/23/2009	02111
LISN Model 8028-50-TS-24-BNC	901235 & 903750	05/04/2007	05/04/2009	00374
150kHz HP Filter TTE	G7753	01/22/2008	01/22/2010	02609
Cond cable	N/A	05/11/2007	05/11/2009	MACOM
Attenuator 10dB	N/A	01/22/2009	01/22/2011	P05624

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Essential Insight.mesh Gateway Manager	Bently Nevada LLC.	185510-01	0-17-0D-00-00-2D-99
Essential Insight.mesh Gateway Manager*	Bently Nevada LLC.	185510-01	0-17-0D-00-00-30-C4
DC Power Supply	Traco	TSP090-224-BM	20813126047
DC Power Supply	Traco	TSP090-224-BM	20813126391

Support Devices:

Function	Manufacturer	Model #	S/N
Remote Computer	Dell	DCNE	4FN1YC1
Remote Monitor	Dell	170817	CN-0K0789-732-AAQ
Remote Ethernet Hub	Linksys	5 Port 10/100	R91304 7001587 EB1040
Remote Mote	Dust Networks	Mote	1A D2
Omni-Directional Antenna with 75' of Coax	HyperLink	HGGB2406U	NA
Small Omni-Directional Antenna	Laird/Aerocomm	0600-00014	NA

Test Conditions / Notes:

FCC Part 15.207

This wireless mesh network has components to gather transducer signals that are coming from sensors that are mounted on industrial equipments and returns their respective signals back to a host computer to be used for maintenance and servicing of that equipment. The components include a Gateway Manager module, a number of MOTEs and Repeaters, the sensing transducer and wiring. The Gateway Manager module services as the data collection point as well as connection into the wireless mesh and relays the data over to a host computer system. Additionally, the Gateway Manager handles the management of the network communication link between the

MOTEs and Repeater, and determines the path that the data takes through the network back to the Gateway Manager.

The Gateway Manager (part number 185510-01) is the main interface component that connects the wireless nodes (via MOTES and Repeaters) of the mesh network over to the computer system. The Gateway Manager can be operated as a single unit or in redundancy mod configuration. In the second mode, which is the mode under test, two units are used and both are connected to the computer via each module's Ethernet ports and to one another via a serial port. The primary unit is in operational mode and second unit in stand-by mode. If the primary unit fails, then the secondary unit takes over the network responsibilities.

Ports:
Power input port is normally connected to external 24-volt DC supply power.
Ethernet Cat-5 is used between the Network hub or Computer and the Gateway Manager module.

Serial-1: RS-232 is only used in the Redundancy configuration and connects between the two Gateway Manager modules.

Serial-2: Normally is not connected to or used. This is a RS-232 link and this maintenance port is used by a GE service person and would be connected between the service computer and Gateway Manager module Unterminated serial cables are connected to the Serial-2 Ports.

Antenna interface uses a reverse style SMA connector on the Gateway Manager antenna connector interface port. There are two antenna configurations that can be connected to the Gateway Manager module. One is via a 2 dBi short antenna (rubber ducky) that is directly connected at the rear of the module and the second configuration uses a 75 feet antenna cable -4 dB with a 6 dBi antenna so that the wireless link can be mounted remotely. An in-line surge suppressor is mounted between the cable and the Gateway Manager module's antenna port. A 2 dBi antenna is connected to one of the EUT and the 6 dBi antenna is connected to the second EUT.

Rack Master unit

Frequencies investigated were from 0.15-30 MHz

The temperature was 21.9°C and the humidity was 45%.
RBW = 9 kHz VBW = 30 kHz

Transducer Legend:

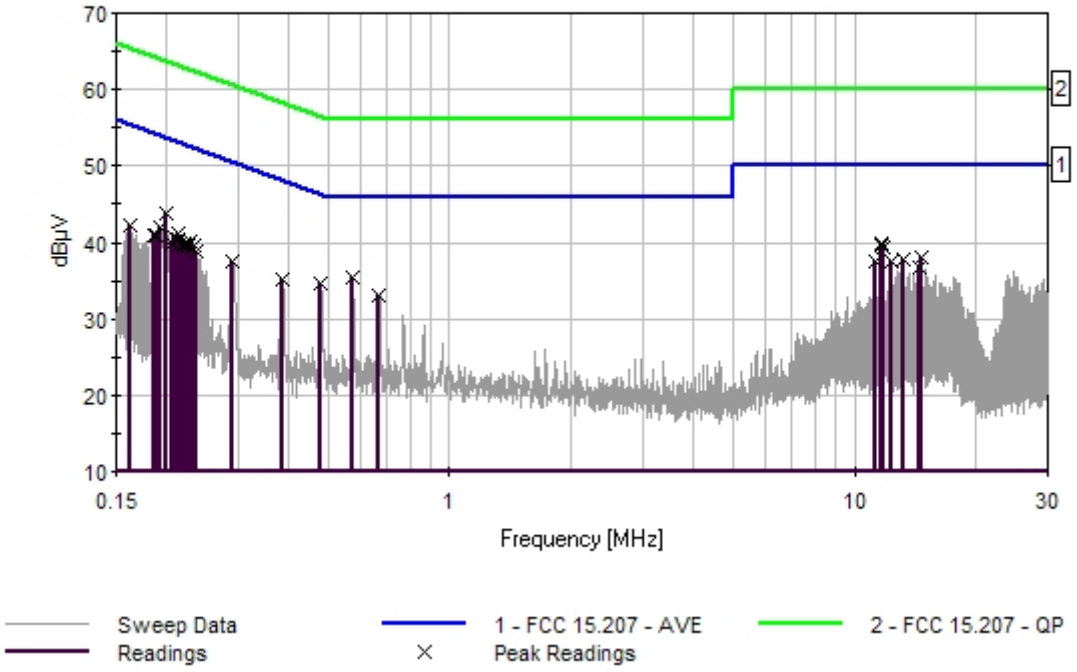
T1=MACOND	T2=Filter 150kHz HP AN02609
T3=LISN - BK AN00374	T4=ANP05624 (10dB Attn)

Measurement Data: Reading listed by margin. Test Lead: Black

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	199.450k	33.4	+0.2	+0.2	+0.2	+9.7	+0.0	43.7	53.6	-9.9	Black
2	11.616M	28.5	+1.0	+0.1	+0.5	+9.7	+0.0	39.8	50.0	-10.2	Black
3	575.416k	24.8	+0.3	+0.3	+0.3	+9.8	+0.0	35.5	46.0	-10.5	Black
4	11.707M	28.2	+1.0	+0.1	+0.5	+9.7	+0.0	39.5	50.0	-10.5	Black
5	11.806M	28.0	+1.0	+0.1	+0.5	+9.7	+0.0	39.3	50.0	-10.7	Black
6	479.424k	24.3	+0.3	+0.3	+0.2	+9.6	+0.0	34.7	46.3	-11.6	Black

7	192.905k	31.6	+0.2	+0.3	+0.2	+9.7	+0.0	42.0	53.9	-11.9	Black
8	14.598M	26.4	+1.1	+0.2	+0.7	+9.7	+0.0	38.1	50.0	-11.9	Black
9	212.540k	30.7	+0.2	+0.3	+0.2	+9.7	+0.0	41.1	53.1	-12.0	Black
10	13.247M	26.3	+1.0	+0.2	+0.6	+9.7	+0.0	37.8	50.0	-12.2	Black
11	229.266k	29.6	+0.3	+0.3	+0.2	+9.7	+0.0	40.1	52.5	-12.4	Black
12	11.229M	26.3	+1.0	+0.1	+0.4	+9.7	+0.0	37.5	50.0	-12.5	Black
13	12.283M	26.2	+1.0	+0.1	+0.5	+9.7	+0.0	37.5	50.0	-12.5	Black
14	209.631k	30.3	+0.2	+0.2	+0.2	+9.7	+0.0	40.6	53.2	-12.6	Black
15	214.721k	30.0	+0.2	+0.3	+0.2	+9.7	+0.0	40.4	53.0	-12.6	Black
16	219.812k	29.6	+0.2	+0.3	+0.2	+9.7	+0.0	40.0	52.8	-12.8	Black
17	234.356k	29.0	+0.3	+0.3	+0.2	+9.7	+0.0	39.5	52.3	-12.8	Black
18	216.903k	29.6	+0.2	+0.3	+0.2	+9.7	+0.0	40.0	52.9	-12.9	Black
19	669.952k	22.5	+0.3	+0.3	+0.2	+9.8	+0.0	33.1	46.0	-12.9	Black
20	227.084k	29.1	+0.3	+0.3	+0.2	+9.7	+0.0	39.6	52.6	-13.0	Black
21	386.342k	24.7	+0.3	+0.2	+0.2	+9.7	+0.0	35.1	48.1	-13.0	Black
22	161.635k	31.0	+0.2	+1.2	+0.2	+9.7	+0.0	42.3	55.4	-13.1	Black
23	231.447k	28.8	+0.3	+0.3	+0.2	+9.7	+0.0	39.3	52.4	-13.1	Black
24	291.805k	27.0	+0.3	+0.2	+0.2	+9.7	+0.0	37.4	50.5	-13.1	Black
25	185.633k	30.6	+0.2	+0.3	+0.2	+9.7	+0.0	41.0	54.2	-13.2	Black
26	221.993k	29.1	+0.2	+0.3	+0.2	+9.7	+0.0	39.5	52.7	-13.2	Black
27	187.815k	30.4	+0.2	+0.3	+0.2	+9.7	+0.0	40.8	54.1	-13.3	Black
28	14.508M	25.0	+1.1	+0.2	+0.7	+9.7	+0.0	36.7	50.0	-13.3	Black
29	205.268k	29.7	+0.2	+0.2	+0.2	+9.7	+0.0	40.0	53.4	-13.4	Black
30	236.538k	28.3	+0.3	+0.3	+0.2	+9.7	+0.0	38.8	52.2	-13.4	Black

CKC Laboratories Date: 2/4/2009 Time: 4:03:31 PM Bently Nevada WO#: 88570
FCC 15.207 - AVE Test Lead: Black 120V 60Hz Sequence#: 14
Bently Nevada LLC. M/N 185510-01



Test Location: CKC Laboratories •5046 Sierra Pines Dr. • Mariposa, CA 95338 • 209 966-5240

Customer:	**Bently Nevada LLC.**		
Specification:	**FCC 15.207 - AVE**		
Work Order #:	**88570**	Date:	2/4/2009
Test Type:	**Conducted Emissions**	Time:	3:49:14 PM
Equipment:	**Essential Insight.mesh Gateway Manager**	Sequence#:	13
Manufacturer:	Bently Nevada LLC.	Tested By:	Chuck Kendall
Model:	185510-01		120V 60Hz
S/N:	0-17-0D-00-00-30-C4		

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8593EM Spectrum Analyzer	3624A00159	03/23/2007	03/23/2009	02111
LISN Model 8028-50-TS-24-BNC	901235 & 903750	05/04/2007	05/04/2009	00374
150kHz HP Filter TTE	G7753	01/22/2008	01/22/2010	02609
Cond cable	N/A	05/11/2007	05/11/2009	MACOM
Attenuator 10dB	N/A	01/22/2009	01/22/2011	P05624

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Essential Insight.mesh Gateway Manager	Bently Nevada LLC.	185510-01	0-17-0D-00-00-2D-99
Essential Insight.mesh Gateway Manager*	Bently Nevada LLC.	185510-01	0-17-0D-00-00-30-C4
DC Power Supply	Traco	TSP090-224-BM	20813126047
DC Power Supply	Traco	TSP090-224-BM	20813126391

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Function	Manufacturer	Model #	S/N
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Remote Monitor	Dell	170817	CN-0K0789-732-AAQ
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Remote Mote	Dust Networks	Mote	1A D2
Omni-Directional Antenna with 75' of Coax	HyperLink	HGGB2406U	NA
Small Omni-Directional Antenna	Laird/Aerocomm	0600-00014	NA

Test Conditions / Notes:

FCC 15.207

This wireless mesh network has components to gather transducer signals that are coming from sensors that are mounted on industrial equipments and returns their respective signals back to a host computer to be used for maintenance and servicing of that equipment. The components include a Gateway Manager module, a number of MOTEs and Repeaters, the sensing transducer and wiring. The Gateway Manager module services as the data collection point as well as connection into the wireless mesh and relays the data over to a host computer system. Additionally, the Gateway Manager handles the management of the network communication link between the MOTEs and Repeater, and determines the path that the data takes through the network back to the Gateway Manager.

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Ports:
Power input port is normally connected to external 24-volt DC supply power.
Ethernet Cat-5 is used between the Network hub or Computer and the Gateway Manager module.

Serial-1: RS-232 is only used in the Redundancy configuration and connects between the two Gateway Manager modules.

Serial-2: Normally is not connected to or used. This is a RS-232 link and this maintenance port is used by a GE service person and would be connected between the service computer and Gateway Manager module Unterminated serial cables are connected to the Serial-2 Ports.

Antenna interface uses a reverse style SMA connector on the Gateway Manager antenna connector interface port. There are two antenna configurations that can be connected to the Gateway Manager module. One is via a 2 dBi short antenna (rubber ducky) that is directly connected at the rear of the module and the second configuration uses a 75 feet antenna cable -4 dB with a 6 dBi antenna so that the wireless link can be mounted remotely. An in-line surge suppressor is mounted between the cable and the Gateway Manager module's antenna port. A 2 dBi antenna is connected to one of the EUT and the 6 dBi antenna is connected to the second EUT.

The 802.15.4 transceivers in each of the EUTs are in the receive mode.

Rack Master unit

Frequencies investigated were from 0.15-30 MHz

The temperature was 21.9°C and the humidity was 45%.
RBW = 9 kHz VBW = 30 kHz

Transducer Legend:

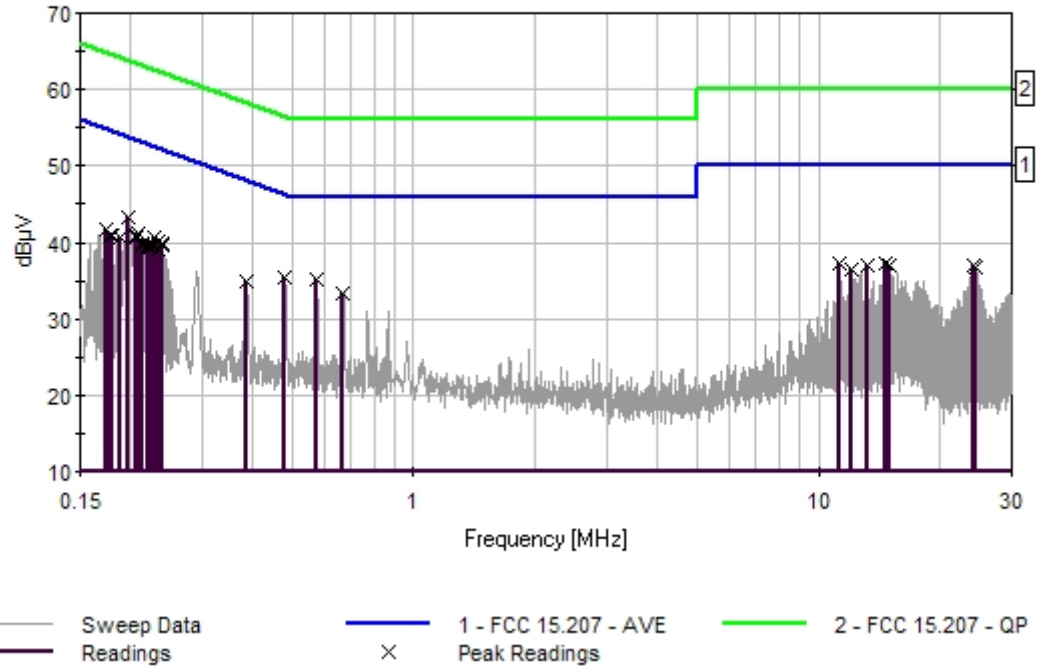
T1=MACOND	T2=Filter 150kHz HP AN02609
T3=LISN - WT AN00374	T4=ANP05624 (10dB Attn)

Measurement Data: Reading listed by margin. Test Lead: White

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	197.268k	32.9	+0.2	+0.2	+0.3	+9.7	+0.0	43.3	53.7	-10.4	White
2	576.143k	24.6	+0.3	+0.3	+0.2	+9.8	+0.0	35.2	46.0	-10.8	White
3	481.606k	24.9	+0.3	+0.3	+0.3	+9.6	+0.0	35.4	46.3	-10.9	White
4	229.266k	30.0	+0.3	+0.3	+0.3	+9.7	+0.0	40.6	52.5	-11.9	White
5	209.631k	30.7	+0.2	+0.2	+0.3	+9.7	+0.0	41.1	53.2	-12.1	White
6	234.356k	29.6	+0.3	+0.3	+0.3	+9.7	+0.0	40.2	52.3	-12.1	White

7	237.992k	29.2	+0.3	+0.3	+0.3	+9.7	+0.0	39.8	52.2	-12.4	White
8	240.174k	29.1	+0.3	+0.3	+0.3	+9.7	+0.0	39.7	52.1	-12.4	White
9	205.268k	30.4	+0.2	+0.2	+0.3	+9.7	+0.0	40.8	53.4	-12.6	White
10	670.680k	22.7	+0.3	+0.3	+0.3	+9.8	+0.0	33.4	46.0	-12.6	White
11	207.449k	30.2	+0.2	+0.2	+0.3	+9.7	+0.0	40.6	53.3	-12.7	White
12	11.229M	25.8	+1.0	+0.1	+0.7	+9.7	+0.0	37.3	50.0	-12.7	White
13	14.679M	25.3	+1.1	+0.2	+1.0	+9.7	+0.0	37.3	50.0	-12.7	White
14	227.084k	29.1	+0.3	+0.3	+0.3	+9.7	+0.0	39.7	52.6	-12.9	White
15	14.968M	25.0	+1.1	+0.2	+1.0	+9.7	+0.0	37.0	50.0	-13.0	White
16	24.094M	24.5	+1.3	+0.2	+1.3	+9.7	+0.0	37.0	50.0	-13.0	White
17	173.271k	31.0	+0.2	+0.5	+0.3	+9.7	+0.0	41.7	54.8	-13.1	White
18	212.540k	29.5	+0.2	+0.3	+0.3	+9.7	+0.0	40.0	53.1	-13.1	White
19	13.247M	25.1	+1.0	+0.2	+0.9	+9.7	+0.0	36.9	50.0	-13.1	White
20	219.812k	29.1	+0.2	+0.3	+0.3	+9.7	+0.0	39.6	52.8	-13.2	White
21	386.342k	24.4	+0.3	+0.2	+0.3	+9.7	+0.0	34.9	48.1	-13.2	White
22	24.484M	24.3	+1.3	+0.2	+1.3	+9.7	+0.0	36.8	50.0	-13.2	White
23	221.993k	28.9	+0.2	+0.3	+0.3	+9.7	+0.0	39.4	52.7	-13.3	White
24	232.902k	28.4	+0.3	+0.3	+0.3	+9.7	+0.0	39.0	52.3	-13.3	White
25	187.815k	30.2	+0.2	+0.3	+0.3	+9.7	+0.0	40.7	54.1	-13.4	White
26	224.175k	28.7	+0.3	+0.3	+0.3	+9.7	+0.0	39.3	52.7	-13.4	White
27	180.543k	30.4	+0.2	+0.4	+0.3	+9.7	+0.0	41.0	54.5	-13.5	White
28	214.721k	29.0	+0.2	+0.3	+0.3	+9.7	+0.0	39.5	53.0	-13.5	White
29	12.103M	25.0	+1.0	+0.1	+0.7	+9.7	+0.0	36.5	50.0	-13.5	White
30	178.361k	30.4	+0.2	+0.4	+0.3	+9.7	+0.0	41.0	54.6	-13.6	White

CKC Laboratories Date: 2/4/2009 Time: 3:49:14 PM Bently Nevada LLC. WO#: 88570
FCC 15.207 - AVE Test Lead: White 120V 60Hz Sequence#: 13
Bently Nevada LLC. M/N 185510-01



Test Location: CKC Laboratories •5046 Sierra Pines Dr. • Mariposa, CA 95338 • 209 966-5240

Customer:	**Bently Nevada LLC.**		
Specification:	**FCC 15.207 - AVE**		
Work Order #:	**88570**	Date:	2/4/2009
Test Type:	**Conducted Emissions**	Time:	1:52:21 PM
Equipment:	**Essential Insight.mesh Gateway Manager**	Sequence#:	3
Manufacturer:	Bently Nevada LLC.	Tested By:	Chuck Kendall
Model:	185511-01/179168-01		120V 60Hz
S/N:	0-17-0D-00-00-30-B6 & 0-17-0D-00-00-2E-D9		

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A	US443000407	08/07/2008	08/07/2010	02660
LISN Model 8028-50-TS-24-BNC	901235 & 903750	05/04/2007	05/04/2009	00374
150kHz HP Filter TTE	G7753	01/22/2008	01/22/2010	02609
Cond cable	N/A	05/11/2007	05/11/2009	MACOM
Attenuator 10dB	N/A	01/22/2009	01/22/2011	P05624

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Essential Insight.mesh Gateway Manager*	Bently Nevada LLC.	185511-01/179168-01	0-17-0D-00-00-30-B6
Essential Insight.mesh Gateway Manager	Bently Nevada LLC.	185511-01/179168-01	0-17-0D-00-00-2E-D9
DC Power Supply	Traco	TSP090-224-BM	20813126047
DC Power Supply	Traco	TSP090-224-BM	20813126391

Support Devices:

Function	Manufacturer	Model #	S/N
Remote Computer	Dell	DCNE	4FN1YC1
Remote Monitor	Dell	170817	CN-0K0789-732-AAQ
Remote Ethernet Hub	Linksys	5 Port 10/100	R91304 7001587 EB1040
Remote Mote	Dust Networks	Mote	1A D2
Omni-Directional Antenna with 75' of Coax	HyperLink	HGGB2406U	NA
Small Omni-Directional Antenna	Laird/Aerocomm	0600-00014	NA

Test Conditions / Notes:

FCC Part 15.207

This wireless mesh network has components to gather transducer signals that are coming from sensors that are mounted on industrial equipments and returns their respective signals back to a host computer to be used for maintenance and servicing of that equipment. The components include a Gateway Manager module, a number of MOTEs and Repeaters, the sensing transducers and wiring. The Gateway Manager module service as the data collection point as well as connection into the wireless mesh and relays the data over to a host computer system. Additionally, the Gateway Manager handles the management of the network communication link between the MOTEs and Repeater, and determines the path that the data takes through the network back to the Gateway Manager.

The stand-alone Gateway Manager module is built from two base parts (part number 185511-01 with the interface

base 179168-01) is the main interface component that connects the wireless nodes (via MOTES and Repeaters) of the mesh network over to the computer system. The Gateway Manager can be operated as a single unit or in redundancy mode configuration. In the second mode two units are used and both are connected to the computer via each module's Ethernet ports and to one another via a serial port. The primary unit is in operational mode and second unit in stand-by. If the primary unit fails, then the secondary unit takes over the network responsibilities.

Ports:
Power input port is normally connected to external 24-volt DC supply power.

Ethernet Cat-5 is used between the Network hub or Computer and the Gateway Manager module.

Serial-1: RS-232 is only used in the Redundancy configuration and connects between the two Gateway Manager modules.

Some of the ports on the module are not normally used or are not connected to the Gateway Manager. These ports would normally have covers over them when they are installed at the customer site.

Serial-2: Normally is not connected to or used. This is a RS-232 link and this maintenance port is used by a GE service person and would be connected between the service computer and Gateway Manager module.

The stand-alone interface base is used for other modules and so some of the ports that are built into the base are neither used or are connected to the Gateway Manager module. The multi-pin for base-to-base connector interface is not connected to the Gateway Manager. Additionally, the top Ethernet port of the dual Ethernet port on the rear of the module is not connected to the Gateway Manager. These ports have been covered and are documented in the respective manuals.

Antenna interface uses a reverse style SMA connector on the Gateway Manager antenna connector interface port. There are two antenna configurations that can be connected to the Gateway Manager module. One is via a 2 dB small antenna (rubber ducky) that is directly connected at the rear of the module and the second configuration uses a 75 feet antenna cable -4 dB with a 6 dB antenna so that the wireless link can be mounted remotely. An in-line surge suppressor is mounted between the cable and the Gateway Manager module's antenna port.

Ground strap added to both units.

Stand Alone Master unit

Frequencies investigated were from 0.15-30 MHz
The temperature was 21.9°C and the humidity was 45%.
RBW = 9 kHz VBW = 30 kHz

Transducer Legend:

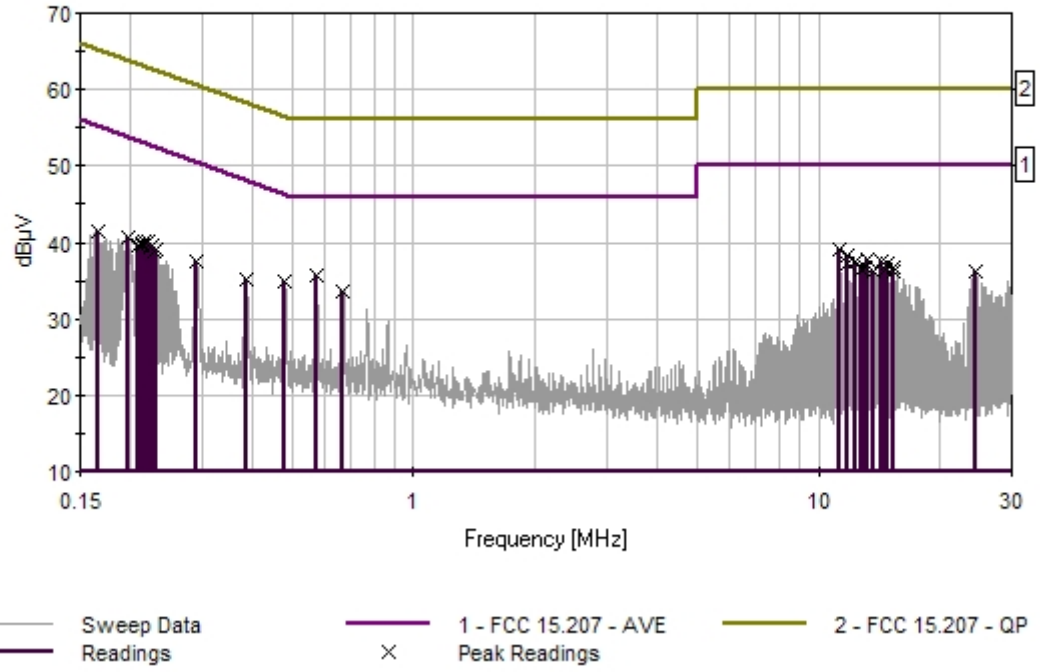
T1=MACOND	T2=Filter 150kHz HP AN02609
T3=LISN - BK AN00374	T4=ANP05624 (10dB Attn)

Measurement Data: Reading listed by margin. Test Lead: Black

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	574.688k	25.1	+0.3	+0.3	+0.3	+9.8	+0.0	35.8	46.0	-10.2	Black
2	11.319M	27.8	+1.0	+0.1	+0.4	+9.7	+0.0	39.0	50.0	-11.0	Black
3	480.879k	24.5	+0.3	+0.3	+0.2	+9.6	+0.0	34.9	46.3	-11.4	Black
4	11.734M	27.0	+1.0	+0.1	+0.5	+9.7	+0.0	38.3	50.0	-11.7	Black

5	13.238M	26.2	+1.0	+0.2	+0.6	+9.7	+0.0	37.7	50.0	-12.3	Black
6	669.952k	23.0	+0.3	+0.3	+0.2	+9.8	+0.0	33.6	46.0	-12.4	Black
7	221.993k	29.8	+0.2	+0.3	+0.2	+9.7	+0.0	40.2	52.7	-12.5	Black
8	12.283M	26.2	+1.0	+0.1	+0.5	+9.7	+0.0	37.5	50.0	-12.5	Black
9	14.292M	25.7	+1.1	+0.2	+0.7	+9.7	+0.0	37.4	50.0	-12.6	Black
10	14.770M	25.6	+1.1	+0.2	+0.7	+9.7	+0.0	37.3	50.0	-12.7	Black
11	216.903k	29.7	+0.2	+0.3	+0.2	+9.7	+0.0	40.1	52.9	-12.8	Black
12	11.797M	25.9	+1.0	+0.1	+0.5	+9.7	+0.0	37.2	50.0	-12.8	Black
13	291.805k	27.1	+0.3	+0.2	+0.2	+9.7	+0.0	37.5	50.5	-13.0	Black
14	197.268k	30.3	+0.2	+0.2	+0.2	+9.7	+0.0	40.6	53.7	-13.1	Black
15	214.721k	29.5	+0.2	+0.3	+0.2	+9.7	+0.0	39.9	53.0	-13.1	Black
16	227.084k	29.0	+0.3	+0.3	+0.2	+9.7	+0.0	39.5	52.6	-13.1	Black
17	385.615k	24.7	+0.3	+0.2	+0.2	+9.7	+0.0	35.1	48.2	-13.1	Black
18	231.447k	28.7	+0.3	+0.3	+0.2	+9.7	+0.0	39.2	52.4	-13.2	Black
19	13.049M	25.3	+1.0	+0.2	+0.6	+9.7	+0.0	36.8	50.0	-13.2	Black
20	224.175k	28.9	+0.3	+0.3	+0.2	+9.7	+0.0	39.4	52.7	-13.3	Black
21	15.256M	24.9	+1.1	+0.2	+0.7	+9.7	+0.0	36.6	50.0	-13.4	Black
22	212.540k	29.2	+0.2	+0.3	+0.2	+9.7	+0.0	39.6	53.1	-13.5	Black
23	12.761M	25.1	+1.0	+0.2	+0.5	+9.7	+0.0	36.5	50.0	-13.5	Black
24	14.679M	24.7	+1.1	+0.2	+0.7	+9.7	+0.0	36.4	50.0	-13.6	Black
25	165.999k	30.5	+0.2	+0.9	+0.2	+9.7	+0.0	41.5	55.2	-13.7	Black
26	209.631k	29.2	+0.2	+0.2	+0.2	+9.7	+0.0	39.5	53.2	-13.7	Black
27	229.266k	28.2	+0.3	+0.3	+0.2	+9.7	+0.0	38.7	52.5	-13.8	Black
28	13.716M	24.6	+1.1	+0.2	+0.6	+9.7	+0.0	36.2	50.0	-13.8	Black
29	15.346M	24.5	+1.1	+0.2	+0.7	+9.7	+0.0	36.2	50.0	-13.8	Black
30	24.374M	23.9	+1.3	+0.2	+1.1	+9.7	+0.0	36.2	50.0	-13.8	Black

CKC Laboratories Date: 2/4/2009 Time: 1:52:21 PM Bently Nevada LLC. WO#: 88570
FCC 15.207 - AVE Test Lead: Black 120V 60Hz Sequence#: 3
Bently Nevada LLC. M/N 185511-01/179168-01



Test Location: CKC Laboratories •5046 Sierra Pines Dr. • Mariposa, CA 95338 • 209 966-5240

Customer:	**Bently Nevada LLC.**		
Specification:	**FCC 15.207 - AVE**		
Work Order #:	**88570**	Date:	2/4/2009
Test Type:	**Conducted Emissions**	Time:	1:59:47 PM
Equipment:	**Essential Insight.mesh Gateway Manager**	Sequence#:	4
Manufacturer:	Bently Nevada LLC.	Tested By:	Chuck Kendall
Model:	185511-01/179168-01		120V 60Hz
S/N:	0-17-0D-00-00-30-B6 & 0-17-0D-00-00-2E-D9		

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8593EM Spectrum Analyzer	3624A00159	03/23/2007	03/23/2009	02111
LISN Model 8028-50-TS-24-BNC	901235 & 903750	05/04/2007	05/04/2009	00374
150kHz HP Filter TTE	G7753	01/22/2008	01/22/2010	02609
Cond cable	N/A	05/11/2007	05/11/2009	MACOM
Attenuator 10dB	N/A	01/22/2009	01/22/2011	P05624

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Essential Insight.mesh Gateway Manager*	Bently Nevada LLC.	185511-01/179168-01	0-17-0D-00-00-30-B6
Essential Insight.mesh Gateway Manager	Bently Nevada LLC.	185511-01/179168-01	0-17-0D-00-00-2E-D9
DC Power Supply	Traco	TSP090-224-BM	20813126047
DC Power Supply	Traco	TSP090-224-BM	20813126391

Support Devices:

Function	Manufacturer	Model #	S/N
Remote Computer	Dell	DCNE	4FN1YC1
Remote Monitor	Dell	170817	CN-0K0789-732-AAQ
Remote Ethernet Hub	Linksys	5 Port 10/100	R91304 7001587 EB1040
Remote Mote	Dust Networks	Mote	1A D2
Omni-Directional Antenna with 75' of Coax	HyperLink	HGGB2406U	NA
Small Omni-Directional Antenna	Laird/Aerocomm	0600-00014	NA

Test Conditions / Notes:

FCC Part 15.207
This wireless mesh network has components to gather transducer signals that are coming from sensors that are mounted on industrial equipments and returns their respective signals back to a host computer to be used for maintenance and servicing of that equipment. The components include a Gateway Manager module, a number of MOTEs and Repeaters, the sensing transducers and wiring. The Gateway Manager module service as the data collection point as well as connection into the wireless mesh and relays the data over to a host computer system. Additionally, the Gateway Manager handles the management of the network communication link between the MOTEs and Repeater, and determines the path that the data takes through the network back to the Gateway Manager.

The stand-alone Gateway Manager module is built from two base parts (part number 185511-01 with the interface base 179168-01) is the main interface component that connects the wireless nodes (via MOTES and Repeaters) of the mesh network over to the computer system. The Gateway Manager can be operated as a single unit or in redundancy mode configuration. In the second mode two units are used and both are connected to the computer via each module's Ethernet ports and to one another via a serial port. The primary unit is in operational mode and second unit in stand-by. If the primary unit fails, then the secondary unit takes over the network responsibilities.

Ports:
Power input port is normally connected to external 24-volt DC supply power.

Ethernet Cat-5 is used between the Network hub or Computer and the Gateway Manager module.

Serial-1: RS-232 is only used in the Redundancy configuration and connects between the two Gateway Manager modules.

Some of the ports on the module are not normally used or are not connected to the Gateway Manager. These ports would normally have covers over them when they are installed at the customer site.

Serial-2: Normally is not connected to or used. This is a RS-232 link and this maintenance port is used by a GE service person and would be connected between the service computer and Gateway Manager module.

The stand-alone interface base is used for other modules and so some of the ports that are built into the base are neither used or are connected to the Gateway Manager module. The multi-pin for base-to-base connector interface is not connected to the Gateway Manager. Additionally, the top Ethernet port of the dual Ethernet port on the rear of the module is not connected to the Gateway Manager. These ports have been covered and are documented in the respective manuals.

Antenna interface uses a reverse style SMA connector on the Gateway Manager antenna connector interface port. There are two antenna configurations that can be connected to the Gateway Manager module. One is via a 2 dB small antenna (rubber ducky) that is directly connected at the rear of the module and the second configuration uses a 75 feet antenna cable -4 dB with a 6 dB antenna so that the wireless link can be mounted remotely. An in-line surge suppressor is mounted between the cable and the Gateway Manager module's antenna port.

Ground strap added to both units.

Stand Alone Master unit

Frequencies investigated were from 0.15-30 MHz

The temperature was 21.9°C and the humidity was 45%.
RBW = 9 kHz VBW = 30 kHz

Transducer Legend:

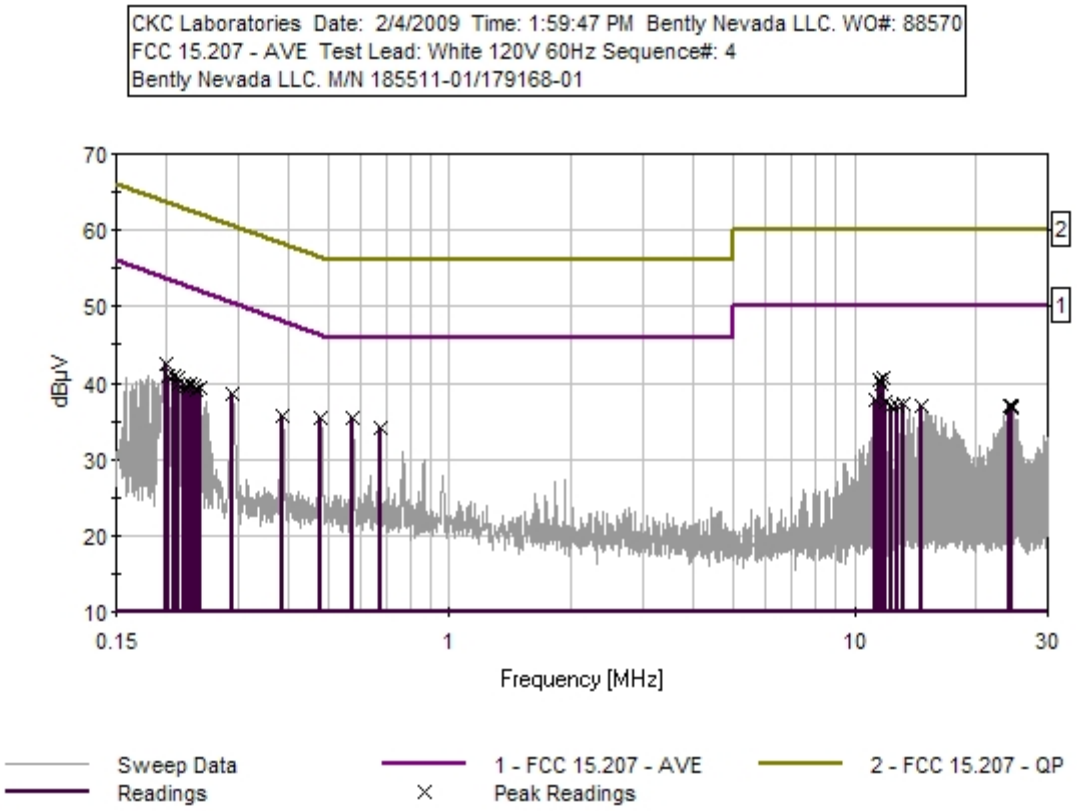
T1=MACOND	T2=Filter 150kHz HP AN02609
T3=LISN - WT AN00374	T4=ANP05624 (10dB Attn)

Measurement Data: Reading listed by margin. Test Lead: White

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	11.797M	29.1	+1.0	+0.1	+0.7	+9.7	+0.0	40.6	50.0	-9.4	White
2	11.526M	28.8	+1.0	+0.1	+0.7	+9.7	+0.0	40.3	50.0	-9.7	White
3	11.707M	28.4	+1.0	+0.1	+0.7	+9.7	+0.0	39.9	50.0	-10.1	White

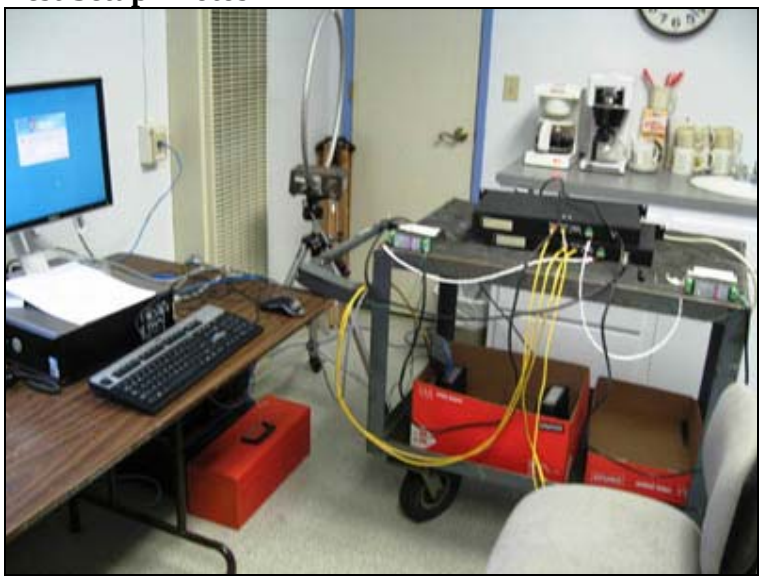
4	576.143k	24.7	+0.3	+0.3	+0.2	+9.8	+0.0	35.3	46.0	-10.7	White
5	479.424k	24.9	+0.3	+0.3	+0.3	+9.6	+0.0	35.4	46.3	-10.9	White
6	200.177k	32.0	+0.2	+0.2	+0.3	+9.7	+0.0	42.4	53.6	-11.2	White
7	291.805k	28.1	+0.3	+0.2	+0.2	+9.7	+0.0	38.5	50.5	-12.0	White
8	672.134k	23.3	+0.3	+0.3	+0.3	+9.8	+0.0	34.0	46.0	-12.0	White
9	11.319M	26.4	+1.0	+0.1	+0.7	+9.7	+0.0	37.9	50.0	-12.1	White
10	209.631k	30.5	+0.2	+0.2	+0.3	+9.7	+0.0	40.9	53.2	-12.3	White
11	214.721k	30.1	+0.2	+0.3	+0.3	+9.7	+0.0	40.6	53.0	-12.4	White
12	386.342k	25.2	+0.3	+0.2	+0.3	+9.7	+0.0	35.7	48.1	-12.4	White
13	202.359k	30.6	+0.2	+0.2	+0.3	+9.7	+0.0	41.0	53.5	-12.5	White
14	229.266k	29.4	+0.3	+0.3	+0.3	+9.7	+0.0	40.0	52.5	-12.5	White
15	11.887M	26.0	+1.0	+0.1	+0.7	+9.7	+0.0	37.5	50.0	-12.5	White
16	242.355k	28.7	+0.3	+0.3	+0.3	+9.7	+0.0	39.3	52.0	-12.7	White
17	13.238M	25.5	+1.0	+0.2	+0.9	+9.7	+0.0	37.3	50.0	-12.7	White
18	234.356k	28.9	+0.3	+0.3	+0.3	+9.7	+0.0	39.5	52.3	-12.8	White
19	221.993k	29.3	+0.2	+0.3	+0.3	+9.7	+0.0	39.8	52.7	-12.9	White
20	12.274M	25.5	+1.0	+0.1	+0.8	+9.7	+0.0	37.1	50.0	-12.9	White
21	12.761M	25.4	+1.0	+0.2	+0.8	+9.7	+0.0	37.1	50.0	-12.9	White
22	219.812k	29.3	+0.2	+0.3	+0.3	+9.7	+0.0	39.8	52.8	-13.0	White
23	14.679M	25.0	+1.1	+0.2	+1.0	+9.7	+0.0	37.0	50.0	-13.0	White
24	24.279M	24.5	+1.3	+0.2	+1.3	+9.7	+0.0	37.0	50.0	-13.0	White
25	224.175k	29.0	+0.3	+0.3	+0.3	+9.7	+0.0	39.6	52.7	-13.1	White
26	24.368M	24.4	+1.3	+0.2	+1.3	+9.7	+0.0	36.9	50.0	-13.1	White

27	236.538k	28.4	+0.3	+0.3	+0.3	+9.7	+0.0	39.0	52.2	-13.2	White
28	24.464M	24.3	+1.3	+0.2	+1.3	+9.7	+0.0	36.8	50.0	-13.2	White
29	212.540k	29.3	+0.2	+0.3	+0.3	+9.7	+0.0	39.8	53.1	-13.3	White
30	227.084k	28.7	+0.3	+0.3	+0.3	+9.7	+0.0	39.3	52.6	-13.3	White

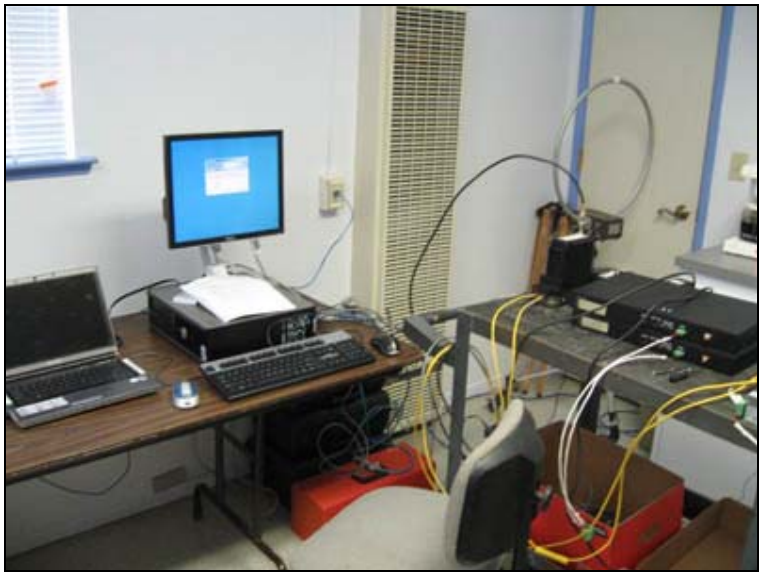


FCC 15.247(a)(2) - 6dB BANDWIDTH

Test Setup Photos



Rack



Stand Alone

Test Location: CKC Laboratories •5046 Sierra Pines Dr. • Mariposa, CA 95338 • 209 966-5240

Customer:	**Bently Nevada LLC.**		
Specification:	**15.247(b)**		
Work Order #:	**88570**	Date:	2/12/2009
Test Type:	**Maximized Emissions**	Time:	17:06:08
Equipment:	**Essential Insight.mesh Gateway Manager**	Sequence#:	70
Manufacturer:	Bently Nevada LLC.	Tested By:	Chuck Kendall
Model:	185510-01		
S/N:	0-17-0D-00-00-30-C4		

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A	US443000407	08/07/2008	08/07/2010	02660
Cable, Andrews Hardline HF-005-20	NA	09/04/2007	09/04/2009	P05346

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Essential Insight.mesh Gateway Manager*	Bently Nevada LLC.	185510-01	0-17-0D-00-00-30-C4
Essential Insight.mesh Gateway Manager	Bently Nevada LLC.	185510-01	0-17-0D-00-00-2D-99
DC Power Supply	Traco	TSP090-224-BM	20813126047
DC Power Supply	Traco	TSP090-224-BM	20813126391

Support Devices:

Function	Manufacturer	Model #	S/N
Remote Computer	Dell	DCNE	4FN1YC1
Remote Monitor	Dell	170817	CN-0K0789-732-AAQ
Remote Ethernet Hub	Linksys	5 Port 10/100	R91304 7001587 EB1040
Remote Mote	Dust Networks	Mote	1A D2

Test Conditions / Notes:

FCC 15.247 Occupied Band Width EUT is 802.15.4 transmitter and is operating on the Low, Mid, and High channels as noted in the datasheet readings. The transmitter is transmitting continuously with modulation - Channel 0 Low = 2405 MHz, Channel 8 Mid = 2445 MHz, and Channel 15 High = 2480 MHz. The temperature was 22.3°C and the humidity was 35%. Frequency range investigated was 2.4 GHz to 2.4835 GHz RBW=100kHz, VBW=300kHz with a 20 MHz span centered on the respective frequency.

This wireless mesh network has components to gather transducer signals that are coming from sensors that are mounted on industrial equipments and returns their respective signals back to a host computer to be used for maintenance and servicing of that equipment. The components include a Gateway Manager module, a number of MOTEs and Repeaters, the sensing transducer and wiring. The Gateway Manager module services as the data collection point as well as connection into the wireless mesh and relays the data over to a host computer system. Additionally, the Gateway Manager handles the management of the network communication link between the MOTEs and Repeater, and determines the path that the data takes through the network back to the Gateway Manager.

The Gateway Manager (part number 185510-01) is the main interface component that connects the wireless nodes (via MOTES and Repeaters) of the mesh network over to the computer system. The Gateway Manager can be operated as a single unit or in redundancy mod configuration. In the second mode, which is the mode under test, two units are used and both are connected to the computer via each module's Ethernet ports and to one another via a serial port. The primary unit is in operational mode and second unit in stand-by mode. If the primary unit fails,

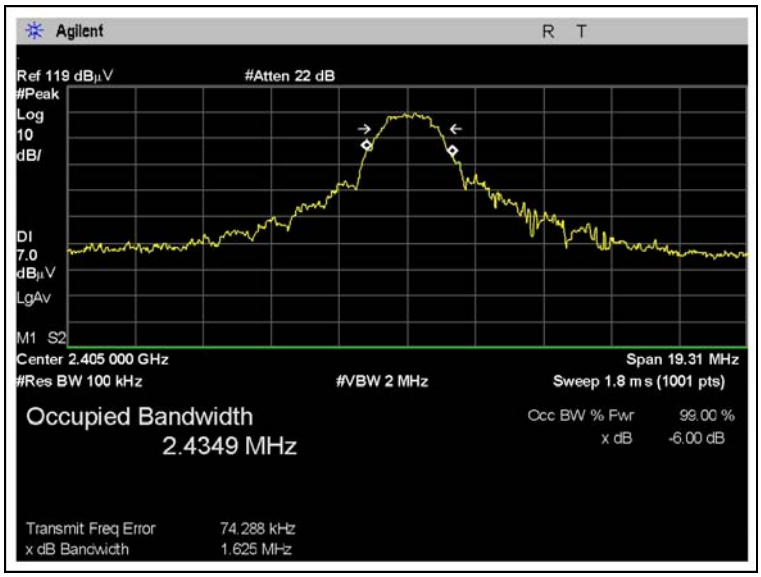
then the secondary unit takes over the network responsibilities. Ports: Power input port is normally connected to external 24-volt DC supply power. Ethernet Cat-5 is used between the Network hub or Computer and the Gateway Manager module. Serial-1: RS-232 is only used in the Redundancy configuration and connects between the two Gateway Manager modules. Serial-2: Normally is not connected to or used. This is a RS-232 link and this maintenance port is used by a GE service person and would be connected between the service computer and Gateway Manager module Unterminated serial cables are connected to the Serial-2 Ports. Antenna interface uses a reverse style SMA connector on the Gateway Manager antenna connector interface port. There are two antenna configurations that can be connected to the Gateway Manager module. One is via a 2 dBi short antenna (rubber ducky) that is directly connected at the rear of the module and the second configuration uses a 75 feet antenna cable -4 dB with a 6 dBi antenna so that the wireless link can be mounted remotely. An in-line surge suppressor is mounted between the cable and the Gateway Manager module's antenna port. A 2 dBi antenna is connected to one of the EUT and the 6 dBi antenna is connected to the second EUT. Rack Units

Rack Model

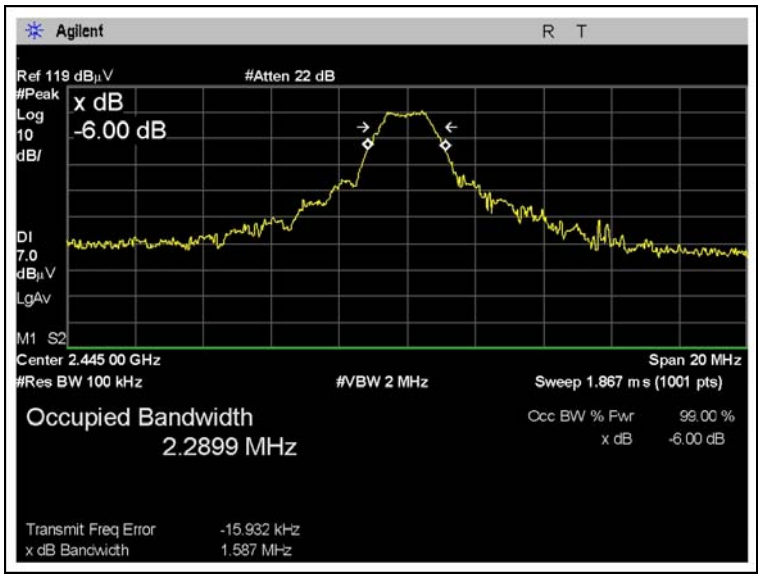
Channel	6 dB Bandwidth	26 dB Bandwidth	99% Bandwidth
2405 MHz	1.63 MHz	3.80 MHz	2.43 MHz
2445 MHz	1.59 MHz	3.62 MHz	2.29 MHz
2480 MHz	1.43 MHz	3.50 MHz	2.29 MHz

Test Plots

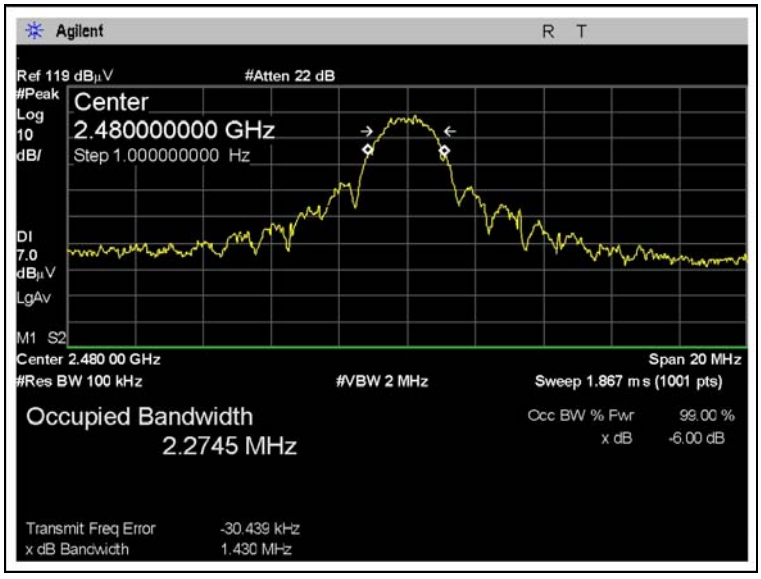
OCCUPIED BANDWIDTH -6dB RACK LOW CHANNEL



OCCUPIED BANDWIDTH -6dB RACK MID CHANNEL



OCCUPIED BANDWIDTH -6dB RACK HIGH CHANNEL



Test Location: CKC Laboratories •5046 Sierra Pines Dr. • Mariposa, CA 95338 • 209 966-5240

Customer:	**Bently Nevada LLC.**		
Specification:	**15.247(b)**		
Work Order #:	**88570**	Date:	2/19/2009
Test Type:	**Occupied Band Width**	Time:	10:09:07
Equipment:	**Essential Insight.mesh Gateway Manager**	Sequence#:	71
Manufacturer:	Bently Nevada LLC.	Tested By:	Chuck Kendall
Model:	185511-01/179168-01		
S/N:	0-17-0D-00-00-30-B6		

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A	US443000407	08/07/2008	08/07/2010	02660
Cable, Andrews Hardline HF-005-20	NA	09/28/2007	09/28/2009	P04276

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Essential Insight.mesh Gateway Manager*	Bently Nevada LLC.	185511-01/179168-01	0-17-0D-00-00-30-B6
Essential Insight.mesh Gateway Manager	Bently Nevada LLC.	185511-01/179168-01	0-17-0D-00-00-2E-D9
DC Power Supply	Traco	TSP090-224-BM	20813126047
DC Power Supply	Traco	TSP090-224-BM	20813126391

Support Devices:

Function	Manufacturer	Model #	S/N
Remote Computer	Dell	DCNE	4FN1YC1
Remote Monitor	Dell	170817	CN-0K0789-732-AAQ
Remote Ethernet Hub	Linksys	5 Port 10/100	R91304 7001587 EB1040
Remote Mote	Dust Networks	Mote	1A D2

Test Conditions / Notes:

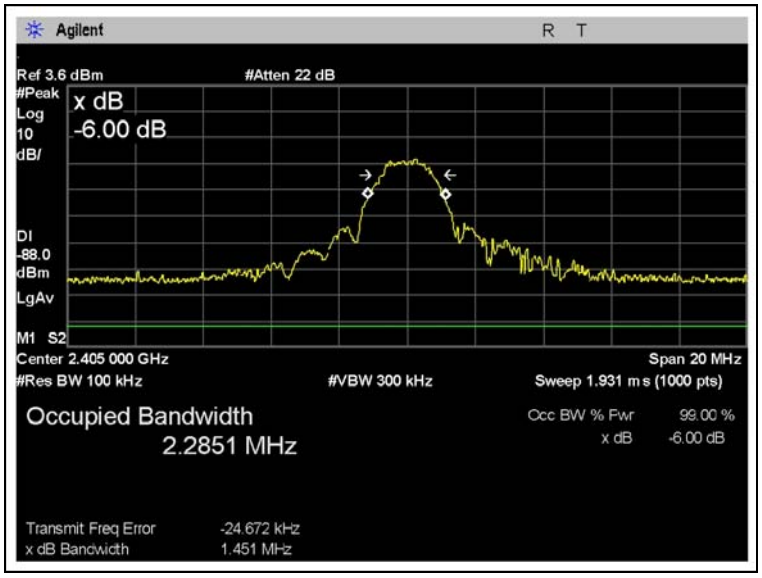
FCC 15.247 OBW EUT is 802.15.4 transmitter and is operating on the Low, Mid, and High channels as noted in the datasheet readings. The transmitter is transmitting continuously with modulation - Channel 0 Low = 2405 MHz, Channel 8 Mid = 2445 MHz, and Channel 15 High = 2480 MHz. The temperature was 22.3°C and the humidity was 35%. Amplifier on Hi Power. This wireless mesh network has components to gather transducer signals that are coming from sensors that are mounted on industrial equipments and returns their respective signals back to a host computer to be used for maintenance and servicing of that equipment. The components include a Gateway Manager module, a number of MOTEs and Repeaters, the sensing transducers and wiring. The Gateway Manager module service as the data collection point as well as connection into the wireless mesh and relays the data over to a host computer system. Additionally, the Gateway Manager handles the management of the network communication link between the MOTEs and Repeater, and determines the path that the data takes through the network back to the Gateway Manager. The stand-alone Gateway Manager module is built from two base parts (part number 185511-01 with the interface base 179168-01) is the main interface component that connects the wireless nodes (via MOTES and Repeaters) of the mesh network over to the computer system. The Gateway Manager can be operated as a single unit or in redundancy mode configuration. In the second mode two units are used and both are connected to the computer via each module's Ethernet ports and to one another via a serial port. The primary unit is in operational mode and second unit in stand-by. If the primary unit fails, then the secondary unit takes over the network responsibilities. Ports: Power input port is normally connected to external 24-volt DC supply power. Ethernet Cat-5 is used between the Network hub or Computer and the Gateway Manager module. Serial-1: RS-232 is only used in the Redundancy configuration and connects between the two Gateway Manager modules. Some of the ports on the module are not normally used or are not connected to the Gateway Manager.

These ports would normally have covers over them when they are installed at the customer site. Serial-2: Normally is not connected to or used. This is a RS-232 link and this maintenance port is used by a GE service person and would be connected between the service computer and Gateway Manager module. The stand-alone interface base is used for other modules and so; some of the ports that are built into the base are neither used or are connected to the Gateway Manager module. The multi-pin for base-to-base connector interface is not connected to the Gateway Manager. Additionally, the top Ethernet port of the dual Ethernet port on the rear of the module is not connected to the Gateway Manager. These ports have been covered and are documented in the respective manuals. Antenna interface uses a reverse style SMA connector on the Gateway Manager antenna connector interface port. There is two antenna configurations that can be connected to the Gateway Manager module. One is via a 2 dB small antenna (rubber ducky) that is directly connected at the rear of the module and the second configuration uses a 75 feet antenna cable -4 dB with a 6 dB antenna so that the wireless link can be mounted remotely. An in-line surge suppressor is mounted between the cable and the Gateway Manager module's antenna port. Stand Alone Unit Frequencies investigated were from 2390 - 2490 MHz RBW = 100 kHz VBW = 300 kHz, span = 20 MHz

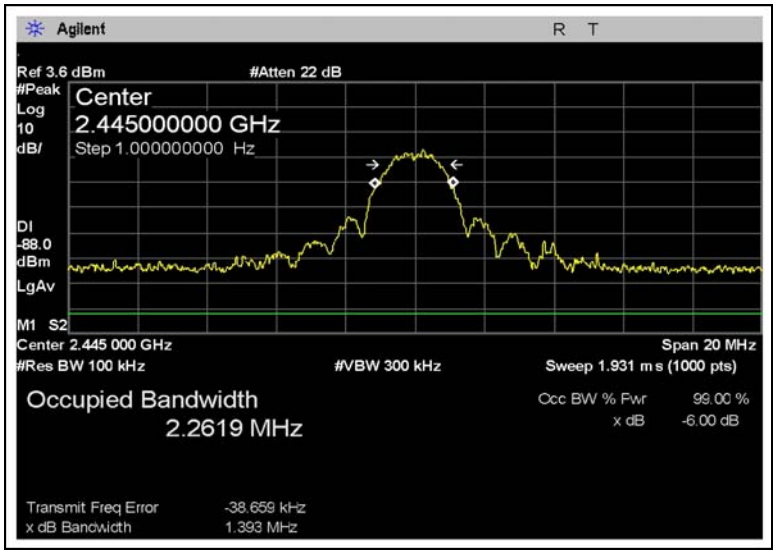
Stand Alone Model

Channel	6 dB Bandwidth	26 dB Bandwidth	99% Bandwidth
2405 MHz	1.451 MHz	3.885 MHz	2.851 MHz
2445 MHz	1.393 MHz	3.166 MHz	2.2619 MHz
2480 MHz	1.504 MHz	3.417 MHz	2.310 MHz

OCCUPIED BANDWIDTH -6dB STAND ALONE
LOW CHANNEL



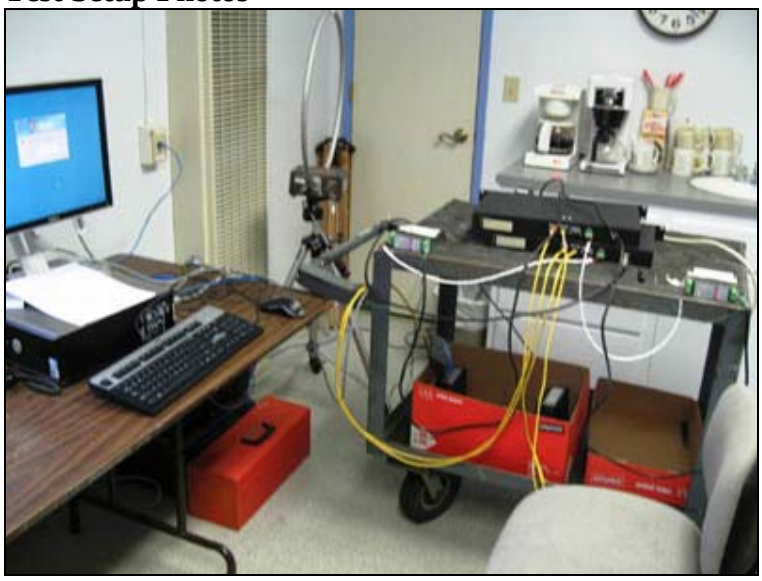
OCCUPIED BANDWIDTH -6dB STAND ALONE
MID CHANNEL



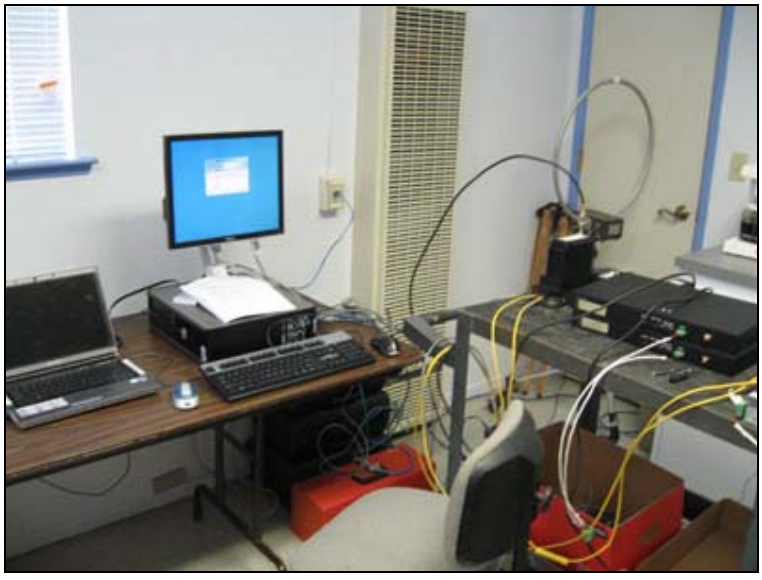
OCCUPIED BANDWIDTH -6dB STAND ALONE
HIGH CHANNEL

FCC 15.247(b)(3) – RF POWER OUTPUT

Test Setup Photos



Rack



Stand Alone

Test Data Sheets

Test Location: CKC Laboratories •5046 Sierra Pines Dr. • Mariposa, CA 95338 • 209 966-5240

Customer: **Bently Nevada LLC.**
Specification: **15.247(b)(3)**
Work Order #: **88570** Date: 2/18/2009
Test Type: **Maximized Emissions** Time: 17:33:23
Equipment: **Essential Insight.mesh Gateway Manager** Sequence#: 60
Manufacturer: Bently Nevada LLC. Tested By: Chuck Kendall
Model: 185510-01
S/N: 0-17-0D-00-00-30-C4 & 0-17-0D-00-00-2D-99

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A	US443000407	08/07/2008	08/07/2010	02660
Cable, Andrews Hardline HF-005-20	NA	09/28/2007	09/28/2009	P04276

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Essential Insight.mesh Gateway Manager*	Bently Nevada LLC.	185510-01	0-17-0D-00-00-30-C4
Essential Insight.mesh Gateway Manager	Bently Nevada LLC.	185510-01	0-17-0D-00-00-2D-99
DC Power Supply	Traco	TSP090-224-BM	20813126047
DC Power Supply	Traco	TSP090-224-BM	20813126047

Support Devices:

Function	Manufacturer	Model #	S/N
Remote Computer	Dell	DCNE	4FN1YC1
Remote Monitor	Dell	170817	CN-0K0789-732-AAQ
Remote Ethernet Hub	Linksys	5 Port 10/100	R91304 7001587 EB1040
Remote Mote	Dust Networks	Mote	1A D2

Test Conditions / Notes:

FCC 247(b)(3) Antenna Conducted Peak ERP Power - Operating

EUT is 802.15.4 transmitter and is operating on the Low, Mid, and High channels as noted in the datasheet readings. The transmitter is transmitting continuously with modulation - Channel 0 Low = 2405 MHz, Channel 8 Mid = 2445 MHz, and Channel 15 High = 2480 MHz. The temperature was 22.3°C and the humidity was 35%.

This wireless mesh network has components to gather transducer signals that are coming from sensors that are mounted on industrial equipments and returns their respective signals back to a host computer to be used for maintenance and servicing of that equipment. The components include a Gateway Manager module, a number of MOTEs and Repeaters, the sensing transducer and wiring. The Gateway Manager module services as the data collection point as well as connection into the wireless mesh and relays the data over to a host computer system. Additionally, the Gateway Manager handles the management of the network communication link between the MOTEs and Repeater, and determines the path that the data takes through the network back to the Gateway Manager.

The Gateway Manager (part number 185510-01) is the main interface component that connects the wireless nodes (via MOTES and Repeaters) of the mesh network over to the computer system. The Gateway Manager can be

operated as a single unit or in redundancy mod configuration. In the second mode, which is the mode under test, two units are used and both are connected to the computer via each module's Ethernet ports and to one another via a serial port. The primary unit is in operational mode and second unit in stand-by mode. If the primary unit fails, then the secondary unit takes over the network responsibilities.

Ports:
Power input port is normally connected to external 24-volt DC supply power.
Ethernet Cat-5 is used between the Network hub or Computer and the Gateway Manager module.

Serial-1: RS-232 is only used in the Redundancy configuration and connects between the two Gateway Manager modules.

Serial-2: Normally is not connected to or used. This is a RS-232 link and this maintenance port is used by a GE service person and would be connected between the service computer and Gateway Manager module Unterminated serial cables are connected to the Serial-2 Ports.

Antenna interface uses a reverse style SMA connector on the Gateway Manager antenna connector interface port. There are two antenna configurations that can be connected to the Gateway Manager module. One is via a 2 dBi short antenna (rubber ducky) that is directly connected at the rear of the module and the second configuration uses a 75 feet antenna cable -4 dB with a 6 dBi antenna so that the wireless link can be mounted remotely. An in-line surge suppressor is mounted between the cable and the Gateway Manager module's antenna port. A 2 dBi antenna is connected to one of the EUT and the 6 dBi antenna is connected to the second EUT.

Rack Units

Frequencies investigated were from 2.4 -2.4835 GHz
RBW = 3 MHz VBW 6 MHz
15.31(e) was satisfied by varying the power supply ± 15% and no variation in power output was observed.

Transducer Legend:

T1=Cable ANP04276 25'

Measurement Data: Reading listed by margin. Test Distance: None

#	Freq MHz	Rdng dBµV	T1 dB	dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	2404.460M	112.9	+2.3				+0.0	115.2	137.0	-21.8	None
									Lo Channel (0)		
2	2444.458M	112.6	+2.3				+0.0	114.9	137.0	-22.1	None
									Mid Channel (8)		
3	2479.454M	111.9	+2.4				+0.0	114.3	137.0	-22.7	None
									High Channel (15)		

Rack Model

Freq MHz	Corrected Reading in dBµV	Corrected Reading in dBm	Corrected Reading in Watts
2404.460M	115.2	8.2	0.0066
2444.458M	114.9	7.9	0.0062
2479.454M	114.3	7.3	0.0054

Test Location: CKC Laboratories •5046 Sierra Pines Dr. • Mariposa, CA 95338 • 209 966-5240

Customer:	**Bently Nevada LLC.**		
Specification:	**15.247(b)(3)**		
Work Order #:	**88570**	Date:	2/19/2009
Test Type:	**Maximized Emissions**	Time:	10:09:07
Equipment:	**Essential Insight.mesh Gateway Manager**	Sequence#:	44
Manufacturer:	Bently Nevada LLC.	Tested By:	Chuck Kendall
Model:	185511-01/179168-01		
S/N:	0-17-0D-00-00-30-B6		

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A	US443000407	08/07/2008	08/07/2010	02660
Cable, Andrews Hardline HF-005-20	NA	09/28/2007	09/28/2009	P04276

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Essential Insight.mesh Gateway Manager*	Bently Nevada LLC.	185511-01/179168-01	0-17-0D-00-00-30-B6
Essential Insight.mesh Gateway Manager	Bently Nevada LLC.	185511-01/179168-01	0-17-0D-00-00-2E-D9
DC Power Supply	Traco	TSP090-224-BM	20813126047
DC Power Supply	Traco	TSP090-224-BM	20813126391

Support Devices:

Function	Manufacturer	Model #	S/N
Remote Computer	Dell	DCNE	4FN1YC1
Remote Monitor	Dell	170817	CN-0K0789-732-AAQ
Remote Ethernet Hub	Linksys	5 Port 10/100	R91304 7001587 EB1040
Remote Mote	Dust Networks	Mote	1A D2

Test Conditions / Notes:

Peak Power 15.247 (b)(3)
EUT is 802.15.4 transmitter and is operating on the Low, Mid, and High channels as noted in the datasheet readings. The transmitter is transmitting continuously with modulation - Channel 0 Low = 2405 MHz, Channel 8 Mid = 2445 MHz, and Channel 15 High = 2480 MHz. The temperature was 22.3°C and the humidity was 35%. Frequency range investigated was 3 MHz. 2.1 dB was included in the shift offset.
Amplifier off Low Power

This wireless mesh network has components to gather transducer signals that are coming from sensors that are mounted on industrial equipments and returns their respective signals back to a host computer to be used for maintenance and servicing of that equipment. The components include a Gateway Manager module, a number of MOTEs and Repeaters, the sensing transducers and wiring. The Gateway Manager module service as the data collection point as well as connection into the wireless mesh and relays the data over to a host computer system. Additionally, the Gateway Manager handles the management of the network communication link between the MOTEs and Repeater, and determines the path that the data takes through the network back to the Gateway Manager.

The stand-alone Gateway Manager module is built from two base parts (part number 185511-01 with the interface base 179168-01) is the main interface component that connects the wireless nodes (via MOTES and Repeaters) of the mesh network over to the computer system. The Gateway Manager can be operated as a single unit or in redundancy mode configuration. In the second mode two units are used and both are connected to the computer via

each module's Ethernet ports and to one another via a serial port. The primary unit is in operational mode and second unit in stand-by. If the primary unit fails, then the secondary unit takes over the network responsibilities.

Ports:
Power input port is normally connected to external 24-volt DC supply power.

Ethernet Cat-5 is used between the Network hub or Computer and the Gateway Manager module.

Serial-1: RS-232 is only used in the Redundancy configuration and connects between the two Gateway Manager modules.

Some of the ports on the module are not normally used or are not connected to the Gateway Manager. These ports would normally have covers over them when they are installed at the customer site.

Serial-2: Normally is not connected to or used. This is a RS-232 link and this maintenance port is used by a GE service person and would be connected between the service computer and Gateway Manager module.

The stand-alone interface base is used for other modules and so some of the ports that are built into the base are neither used or are connected to the Gateway Manager module. The multi-pin for base-to-base connector interface is not connected to the Gateway Manager. Additionally, the top Ethernet port of the dual Ethernet port on the rear of the module is not connected to the Gateway Manager. These ports have been covered and are documented in the respective manuals.

Antenna interface uses a reverse style SMA connector on the Gateway Manager antenna connector interface port. There are two antenna configurations that can be connected to the Gateway Manager module. One is via a 2 dB small antenna (rubber ducky) that is directly connected at the rear of the module and the second configuration uses a 75 feet antenna cable -4 dB with a 6 dB antenna so that the wireless link can be mounted remotely. An in-line surge suppressor is mounted between the cable and the Gateway Manager module's antenna port.

Stand Alone Unit
RBW = 3 MHz VBW = 6 MHz
15.31(e) was satisfied by varying the power supply ± 15% and no variation in power output was observed.

Transducer Legend:

T1=Cable ANP04276 25'

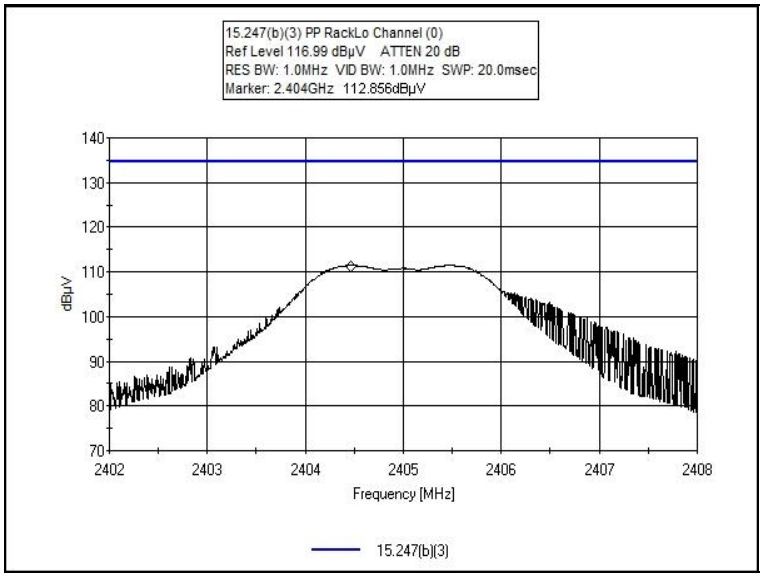
Measurement Data: Reading listed by margin. Test Distance: None

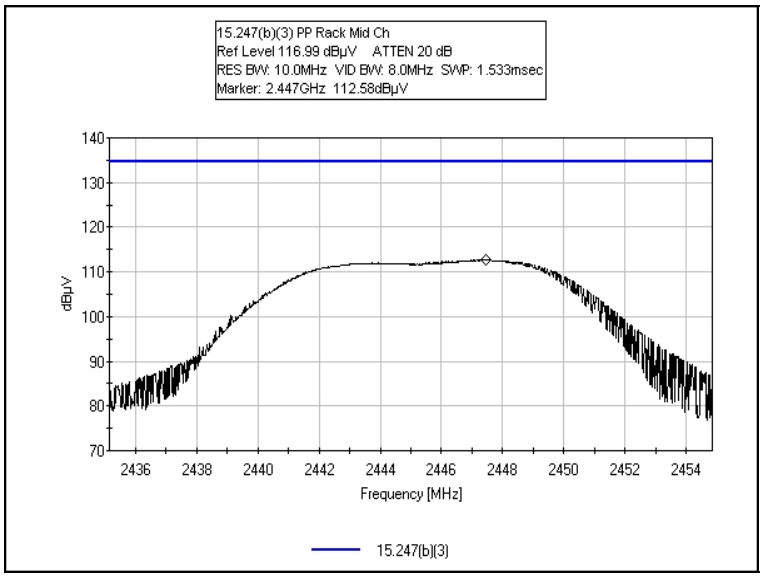
#	Freq MHz	Rdng dBµV	T1 dB	dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	2404.455M	111.8	+2.3				+0.0	114.1	137.0	-22.9	None
									Lo Ch w/new cable		
2	2444.460M	111.8	+2.3				+0.0	114.1	137.0	-22.9	None
									Mid Ch w/new cable		
3	2479.470M	111.6	+2.4				+0.0	114.0	137.0	-23.0	None
									Hi Ch w/new cable		

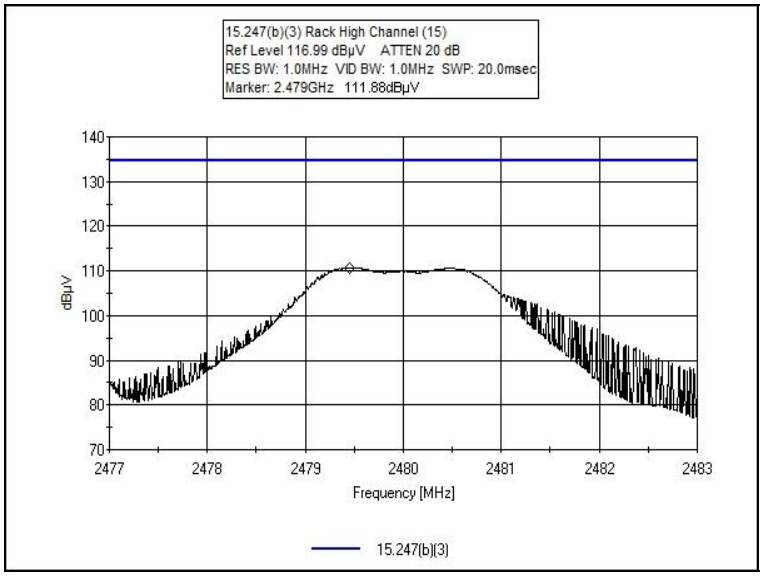
Stand Alone Model

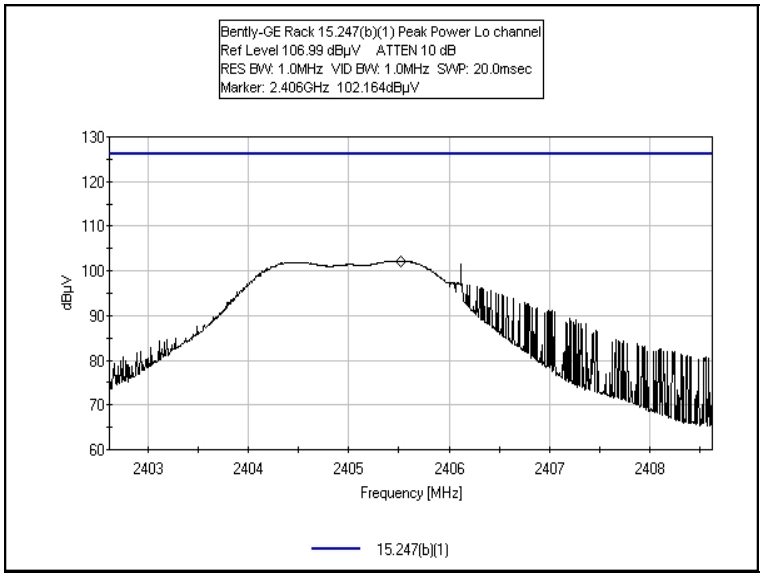
Freq MHz	Corrected Reading in dBµV	Corrected Reading in dBm	Corrected Reading in Watts
2404.455M	114.1	7.1	.0051
2444.460M	114.1	7.1	.0051
2479.470M	114.0	7.0	.0050

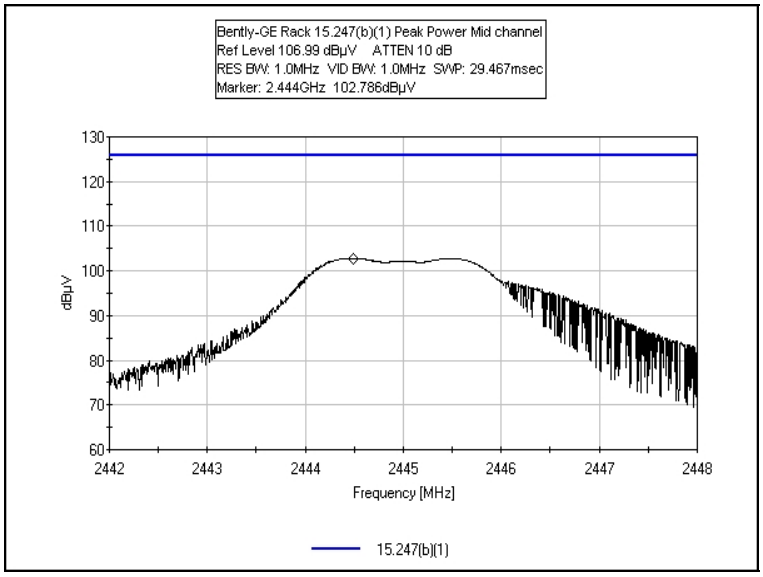
Test Plots

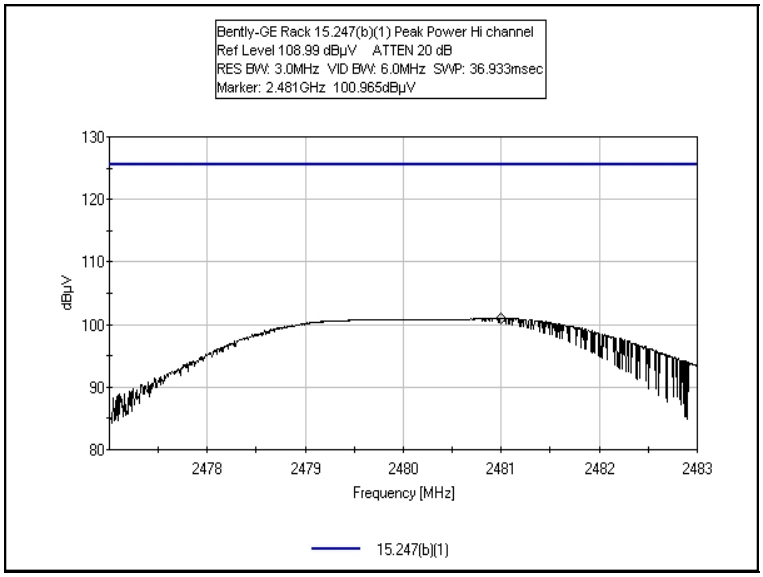

15.247(b)(3) PP RackLo Channel (0)
Ref Level 116.99 dBµV ATTEN 20 dB
RES BW: 1.0MHz VID BW: 1.0MHz SWP: 20.0msec
Marker: 2.404GHz 112.856dBµV
dBµV
Frequency [MHz]
15.247(b)(3)


15.247(b)(3) PP Rack Mid Ch
Ref Level 116.99 dBµV ATTEN 20 dB
RES BW: 10.0MHz VID BW: 8.0MHz SWP: 1.533msec
Marker: 2.447GHz 112.58dBµV
dBµV
Frequency [MHz]
15.247(b)(3)


15.247(b)(3) Rack High Channel (15)
Ref Level 116.99 dBµV ATTEN 20 dB
RES BW: 1.0MHz VID BW: 1.0MHz SWP: 20.0msec
Marker: 2.479GHz 111.88dBµV
140
130
120
110
100
90
80
70
dBµV
2477
2478
2479
2480
2481
2482
2483
Frequency [MHz]
15.247(b)(3)


Bently-GE Rack 15.247(b)(1) Peak Power Lo channel
Ref Level 106.99 dBµV ATTEN 10 dB
RES BW: 1.0MHz VID BW: 1.0MHz SWP: 20.0msec
Marker: 2.406GHz 102.164dBµV
130
120
110
100
90
80
70
60
dBµV
2403
2404
2405
2406
2407
2408
Frequency [MHz]
15.247(b)(1)

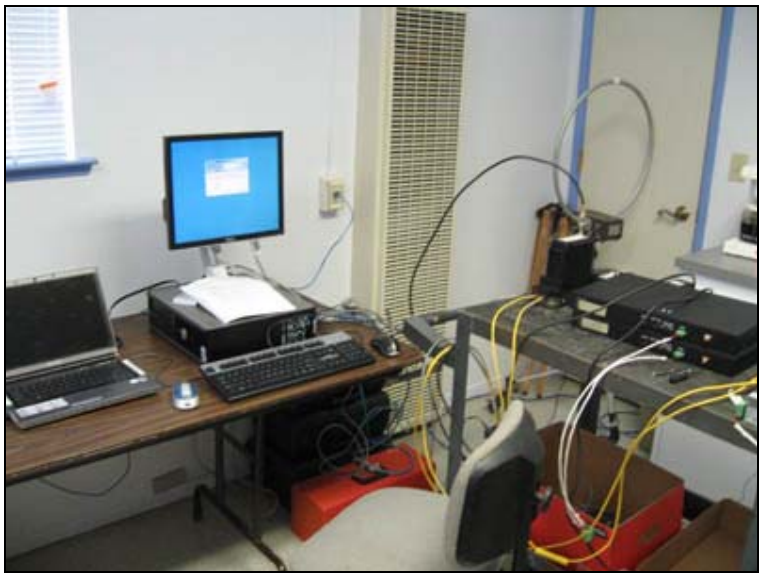

Bently-GE Rack 15.247(b)(1) Peak Power Mid channel
Ref Level 106.99 dBµV ATTEN 10 dB
RES BW: 1.0MHz VID BW: 1.0MHz SWP: 29.467msec
Marker: 2.444GHz 102.786dBµV
dBµV
130
120
110
100
90
80
70
60
2442
2443
2444
2445
2446
2447
2448
Frequency [MHz]
15.247(b)(1)


Bently-GE Rack 15.247(b)(1) Peak Power Hi channel
Ref Level 108.99 dBµV ATTEN 20 dB
RES BW: 3.0MHz VID BW: 6.0MHz SWP: 36.933msec
Marker: 2.481GHz 100.965dBµV
dBµV
130
120
110
100
90
80
2478
2479
2480
2481
2482
2483
Frequency [MHz]
15.247(b)(1)

FCC 15.247(d) – ANTENNA CONDUCTED SPURIOUS EMISSIONS

Test Setup Photos

Rack



Stand Alone

Test Data Sheets

Test Location: CKC Laboratories •5046 Sierra Pines Dr. • Mariposa, CA 95338 • 209 966-5240

Customer:	**Bently Nevada LLC.**		
Specification:	**15.247(d) GE Rack**		
Work Order #:	**88570**	Date:	2/18/2009
Test Type:	**Maximized Emissions**	Time:	1:28:03 PM
Equipment:	**Essential Insight.mesh Gateway Manager**	Sequence#:	54
Manufacturer:	Bently Nevada LLC.	Tested By:	Chuck Kendall
Model:	185510-01		
S/N:	0-17-0D-00-00-30-C4 & 0-17-0D-00-00-2D-99		

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A	US443000407	08/07/2008	08/07/2010	02660
Cable, Andrews Hardline HF-005-20	NA	09/28/2007	09/28/2009	P04276

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Essential Insight.mesh Gateway Manager*	Bently Nevada LLC.	185510-01	0-17-0D-00-00-30-C4
Essential Insight.mesh Gateway Manager	Bently Nevada LLC.	185510-01	0-17-0D-00-00-2D-99
DC Power Supply	Traco	TSP090-224-BM	20813126047
DC Power Supply	Traco	TSP090-224-BM	20813126047

Support Devices:

Function	Manufacturer	Model #	S/N
Remote Computer	Dell	DCNE	4FN1YC1
Remote Monitor	Dell	170817	CN-0K0789-732-AAQ
Remote Ethernet Hub	Linksys	5 Port 10/100	R91304 7001587 EB1040
Remote Mote	Dust Networks	Mote	1A D2

Test Conditions / Notes:

15.247 (d) Antenna Conducted Spurious Emissions Operating

EUT is 802.15.4 transmitter and is operating on the Low, Mid, and High channels as noted in the datasheet readings. The transmitter is transmitting continuously with modulation - Channel 0 Low = 2405 MHz, Channel 8 Mid = 2445 MHz, and Channel 15 High = 2480 MHz. The temperature was 22.3°C and the humidity was 35%. Frequency range investigated was 30 to 25 GHz. High Channel (15) operating.

This wireless mesh network has components to gather transducer signals that are coming from sensors that are mounted on industrial equipments and returns their respective signals back to a host computer to be used for maintenance and servicing of that equipment. The components include a Gateway Manager module, a number of MOTEs and Repeaters, the sensing transducer and wiring. The Gateway Manager module services as the data collection point as well as connection into the wireless mesh and relays the data over to a host computer system. Additionally, the Gateway Manager handles the management of the network communication link between the MOTEs and Repeater, and determines the path that the data takes through the network back to the Gateway Manager.

The Gateway Manager (part number 185510-01) is the main interface component that connects the wireless nodes

(via MOTES and Repeaters) of the mesh network over to the computer system. The Gateway Manager can be operated as a single unit or in redundancy mod configuration. In the second mode, which is the mode under test, two units are used and both are connected to the computer via each module. Ethernet ports and to one another via a serial port. The primary unit is in operational mode and second unit in stand-by mode. If the primary unit fails, then the secondary unit takes over the network responsibilities.

Ports:
Power input port is normally connected to external 24-volt DC supply power.
Ethernet Cat-5 is used between the Network hub or Computer and the Gateway Manager module.

Serial-1: RS-232 is only used in the Redundancy configuration and connects between the two Gateway Manager modules.

Serial-2: Normally is not connected to or used. This is a RS-232 link and this maintenance port is used by a GE service person and would be connected between the service computer and Gateway Manager module Unterminated serial cables are connected to the Serial-2 Ports.

Antenna interface uses a reverse style SMA connector on the Gateway Manager antenna connector interface port. There are two antenna configurations that can be connected to the Gateway Manager module. One is via a 2 dBi short antenna (rubber ducky) that is directly connected at the rear of the module and the second configuration uses a 75 feet antenna cable -4 dB with a 6 dBi antenna so that the wireless link can be mounted remotely. An in-line surge suppressor is mounted between the cable and the Gateway Manager module's antenna port. A 2 dBi antenna is connected to one of the EUT and the 6 dBi antenna is connected to the second EUT.

Rack Units

RBW = 100 kHz VBW 300 kHz

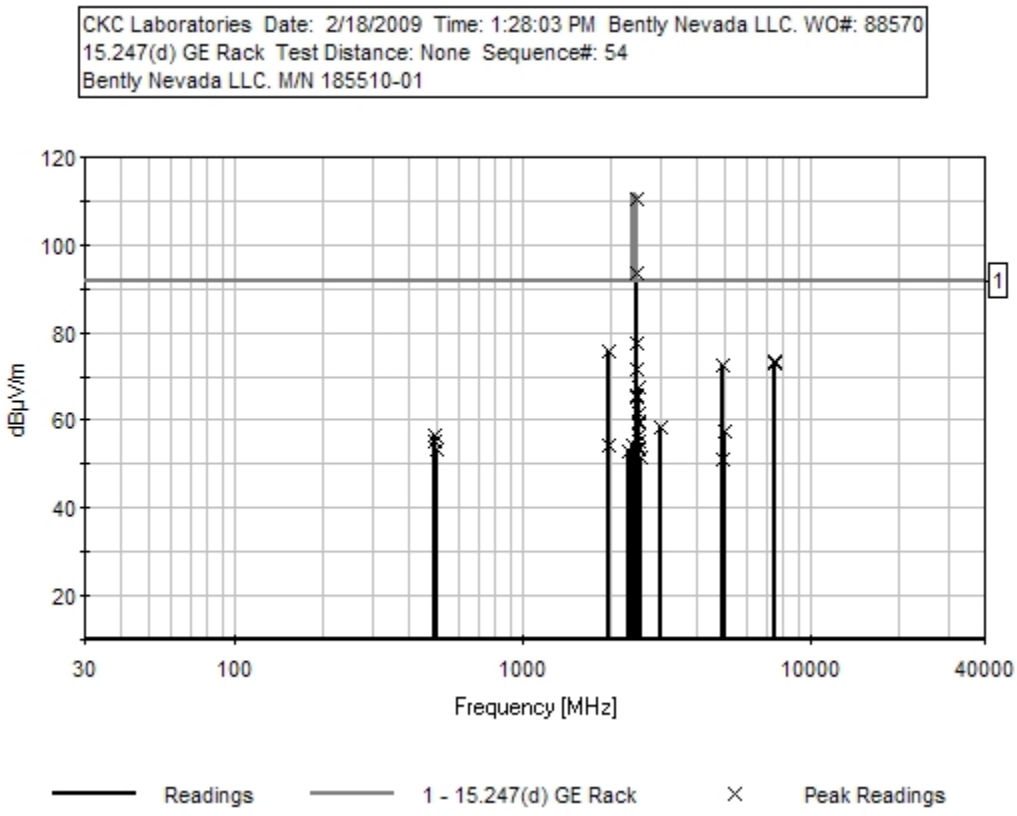
Transducer Legend:

T1=Cable ANP04276 25'

Measurement Data: Reading listed by margin. Test Distance: None

#	Freq MHz	Rdng dBµV	T1 dB	dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	2479.478M	107.8	+2.4				+0.0	110.2	111.5 Fundamental	-1.3	None
2	1983.983M	73.6	+2.2				+0.0	75.8	91.5	-15.7	None
3	7438.432M	69.4	+4.2				+0.0	73.6	91.5	-17.9	None
4	2482.481M	91.0	+2.4				+0.0	93.4	111.5	-18.1	None
5	7441.435M	68.6	+4.2				+0.0	72.8	91.5	-18.7	None
6	4960.957M	68.9	+3.5				+0.0	72.4	91.5	-19.1	None
7	2486.485M	69.1	+2.4				+0.0	71.5	91.5	-20.0	None
8	2499.498M	65.2	+2.4				+0.0	67.6	91.5	-23.9	None
9	2491.490M	63.2	+2.4				+0.0	65.6	91.5	-25.9	None
10	2495.494M	62.7	+2.4				+0.0	65.1	91.5	-26.4	None

11	2504.503M	59.0	+2.4		+0.0	61.4	91.5	-30.1	None
12	2512.511M	57.3	+2.4		+0.0	59.7	91.5	-31.8	None
13	2507.506M	56.8	+2.4		+0.0	59.2	91.5	-32.3	None
14	2976.975M	55.6	+2.7		+0.0	58.3	91.5	-33.2	None
15	2475.474M	75.1	+2.4		+0.0	77.5	111.5	-34.0	None
16	4963.960M	53.9	+3.5		+0.0	57.4	91.5	-34.1	None
17	2516.515M	54.3	+2.4		+0.0	56.7	91.5	-34.8	None
18	496.066M	55.6	+0.9		+0.0	56.5	91.5	-35.0	None
19	495.585M	54.3	+0.9		+0.0	55.2	91.5	-36.3	None
20	2520.519M	52.8	+2.4		+0.0	55.2	91.5	-36.3	None
21	1986.986M	52.3	+2.2		+0.0	54.5	91.5	-37.0	None
22	2399.398M	51.9	+2.3		+0.0	54.2	91.5	-37.3	None
23	2528.527M	51.3	+2.5		+0.0	53.8	91.5	-37.7	None
24	2533.532M	51.1	+2.5		+0.0	53.6	91.5	-37.9	None
25	496.546M	52.6	+0.9		+0.0	53.5	91.5	-38.0	None
26	2525.524M	50.7	+2.5		+0.0	53.2	91.5	-38.3	None
27	2340.339M	50.5	+2.2		+0.0	52.7	91.5	-38.8	None
28	2541.540M	49.2	+2.5		+0.0	51.7	91.5	-39.8	None
29	2395.394M	49.3	+2.3		+0.0	51.6	91.5	-39.9	None
30	4956.953M	47.5	+3.5		+0.0	51.0	91.5	-40.5	None


CKC Laboratories Date: 2/18/2009 Time: 1:28:03 PM Bently Nevada LLC. WO#: 88570
15.247(d) GE Rack Test Distance: None Sequence#: 54
Bently Nevada LLC. M/N 185510-01
120
100
80
60
40
20
dBµV/m
1
30
100
1000
10000
40000
Frequency [MHz]
Readings
1 - 15.247(d) GE Rack
Peak Readings

Test Location: CKC Laboratories •5046 Sierra Pines Dr. • Mariposa, CA 95338 • 209 966-5240

Customer:	**Bently Nevada LLC.**		
Specification:	**15.247(d) GE Rack**		
Work Order #:	**88570**	Date:	2/18/2009
Test Type:	**Maximized Emissions**	Time:	2:03:44 PM
Equipment:	**Essential Insight.mesh Gateway Manager**	Sequence#:	54
Manufacturer:	Bently Nevada LLC.	Tested By:	Chuck Kendall
Model:	185510-01		
S/N:	0-17-0D-00-00-30-C4 & 0-17-0D-00-00-2D-99		

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A	US443000407	08/07/2008	08/07/2010	02660
Cable, Andrews Hardline HF-005-20	NA	09/28/2007	09/28/2009	P04276

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Essential Insight.mesh Gateway Manager*	Bently Nevada LLC.	185510-01	0-17-0D-00-00-30-C4
Essential Insight.mesh Gateway Manager	Bently Nevada LLC.	185510-01	0-17-0D-00-00-2D-99
DC Power Supply	Traco	TSP090-224-BM	20813126047
DC Power Supply	Traco	TSP090-224-BM	20813126047

Support Devices:

Function	Manufacturer	Model #	S/N
Remote Computer	Dell	DCNE	4FN1YC1
Remote Monitor	Dell	170817	CN-0K0789-732-AAQ
Remote Ethernet Hub	Linksys	5 Port 10/100	R91304 7001587 EB1040
Remote Mote	Dust Networks	Mote	1A D2

Test Conditions / Notes:

15.247 (d) Antenna Conducted Spurious Emissions Operating

EUT is 802.15.4 transmitter and is operating on the Low, Mid, and High channels as noted in the datasheet readings. The transmitter is transmitting continuously with modulation - Channel 0 Low = 2405 MHz, Channel 8 Mid = 2445 MHz, and Channel 15 High = 2480 MHz. The temperature was 22.3°C and the humidity was 35%. Frequency range investigated was 30 to 25 GHz Mid Channel (8) operating.

This wireless mesh network has components to gather transducer signals that are coming from sensors that are mounted on industrial equipments and returns their respective signals back to a host computer to be used for maintenance and servicing of that equipment. The components include a Gateway Manager module, a number of MOTEs and Repeaters, the sensing transducer and wiring. The Gateway Manager module services as the data collection point as well as connection into the wireless mesh and relays the data over to a host computer system. Additionally, the Gateway Manager handles the management of the network communication link between the MOTEs and Repeater, and determines the path that the data takes through the network back to the Gateway Manager.

The Gateway Manager (part number 185510-01) is the main interface component that connects the wireless nodes (via MOTES and Repeaters) of the mesh network over to the computer system. The Gateway Manager can be operated as a single unit or in redundancy mod configuration. In the second mode, which is the mode under test,

two units are used and both are connected to the computer via each module. Ethernet ports and to one another via a serial port. The primary unit is in operational mode and second unit in stand-by mode. If the primary unit fails, then the secondary unit takes over the network responsibilities.

Ports:
Power input port is normally connected to external 24-volt DC supply power.
Ethernet Cat-5 is used between the Network hub or Computer and the Gateway Manager module.

Serial-1: RS-232 is only used in the Redundancy configuration and connects between the two Gateway Manager modules.

Serial-2: Normally is not connected to or used. This is a RS-232 link and this maintenance port is used by a GE service person and would be connected between the service computer and Gateway Manager module Unterminated serial cables are connected to the Serial-2 Ports.

Antenna interface uses a reverse style SMA connector on the Gateway Manager antenna connector interface port. There are two antenna configurations that can be connected to the Gateway Manager module. One is via a 2 dBi short antenna (rubber ducky) that is directly connected at the rear of the module and the second configuration uses a 75 feet antenna cable -4 dB with a 6 dBi antenna so that the wireless link can be mounted remotely. An in-line surge suppressor is mounted between the cable and the Gateway Manager module's antenna port. A 2 dBi antenna is connected to one of the EUT and the 6 dBi antenna is connected to the second EUT.

Rack Units

RBW = 100 kHz VBW 300 kHz

Transducer Legend:

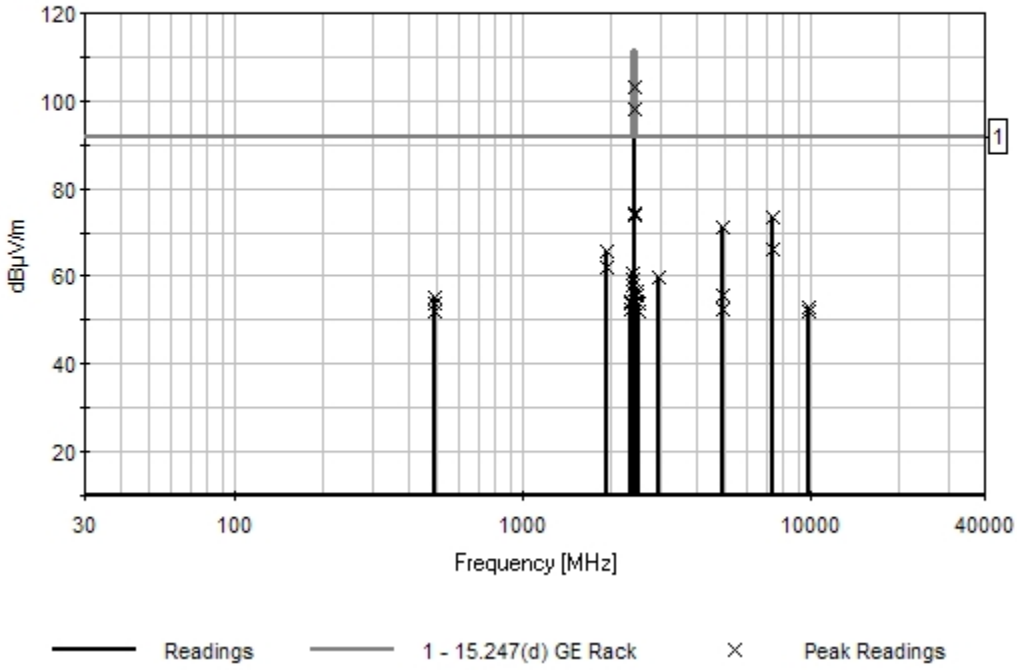
T1=Cable ANP04276 25'

Measurement Data: Reading listed by margin. Test Distance: None

#	Freq MHz	Rdng dBµV	T1 dB	dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	2443.442M	100.9	+2.3				+0.0	103.2	111.5	-8.3	None
2	2447.446M	95.9	+2.3				+0.0	98.2	111.5	-13.3	None
3	7333.327M	69.2	+4.3				+0.0	73.5	91.5	-18.0	None
4	4890.887M	67.9	+3.4				+0.0	71.3	91.5	-20.2	None
5	7337.331M	61.9	+4.3				+0.0	66.2	91.5	-25.3	None
6	1954.954M	63.4	+2.1				+0.0	65.5	91.5	-26.0	None
7	1957.957M	59.9	+2.1				+0.0	62.0	91.5	-29.5	None
8	2397.396M	58.4	+2.3				+0.0	60.7	91.5	-30.8	None
9	2933.932M	57.2	+2.6				+0.0	59.8	91.5	-31.7	None
10	2392.391M	56.9	+2.3				+0.0	59.2	91.5	-32.3	None

11	2384.383M	55.7	+2.3	+0.0	58.0	91.5	-33.5	None
12	2388.387M	55.6	+2.3	+0.0	57.9	91.5	-33.6	None
13	2380.379M	54.1	+2.3	+0.0	56.4	91.5	-35.1	None
14	2485.484M	54.0	+2.4	+0.0	56.4	91.5	-35.1	None
15	2489.488M	53.3	+2.4	+0.0	55.7	91.5	-35.8	None
16	4894.891M	52.3	+3.4	+0.0	55.7	91.5	-35.8	None
17	489.099M	54.3	+0.9	+0.0	55.2	91.5	-36.3	None
18	2375.374M	52.1	+2.3	+0.0	54.4	91.5	-37.1	None
19	2451.450M	71.9	+2.4	+0.0	74.3	111.5	-37.2	None
20	2494.493M	51.9	+2.4	+0.0	54.3	91.5	-37.2	None
21	2438.437M	71.7	+2.3	+0.0	74.0	111.5	-37.5	None
22	488.618M	52.9	+0.9	+0.0	53.8	91.5	-37.7	None
23	2371.370M	51.5	+2.3	+0.0	53.8	91.5	-37.7	None
24	2498.497M	51.2	+2.4	+0.0	53.6	91.5	-37.9	None
25	9781.773M	47.9	+4.8	+0.0	52.7	91.5	-38.8	None
26	2367.366M	50.3	+2.3	+0.0	52.6	91.5	-38.9	None
27	4887.884M	48.9	+3.4	+0.0	52.3	91.5	-39.2	None
28	489.579M	51.3	+0.9	+0.0	52.2	91.5	-39.3	None
29	2502.501M	49.5	+2.4	+0.0	51.9	91.5	-39.6	None
30	9777.769M	47.0	+4.8	+0.0	51.8	91.5	-39.7	None

CKC Laboratories Date: 2/18/2009 Time: 2:03:44 PM Bently Nevada LLC. WO#: 88570
15.247(d) GE Rack Test Distance: None Sequence#: 54
Bently Nevada LLC. M/N 185510-01



Test Location: CKC Laboratories •5046 Sierra Pines Dr. • Mariposa, CA 95338 • 209 966-5240

Customer:	**Bently Nevada LLC.**		
Specification:	**15.247(d) GE Rack**		
Work Order #:	**88570**	Date:	2/18/2009
Test Type:	**Maximized Emissions**	Time:	2:10:13 PM
Equipment:	**Essential Insight.mesh Gateway Manager**	Sequence#:	56
Manufacturer:	Bently Nevada LLC.	Tested By:	Chuck Kendall
Model:	185510-01		
S/N:	0-17-0D-00-00-2D-99/0-17-0D-00-00-30-C4		

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A	US443000407	08/07/2008	08/07/2010	02660
Cable, Andrews Hardline HF-005-20	NA	09/28/2007	09/28/2009	P04276

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Essential Insight.mesh Gateway Manager*	Bently Nevada LLC.	185510-01	0-17-0D-00-00-2D-99
Essential Insight.mesh Gateway Manager	Bently Nevada LLC.	185510-01	0-17-0D-00-00-30-C4
DC Power Supply	Traco	TSP090-224-BM	20813126047
DC Power Supply	Traco	TSP090-224-BM	20813126047

Support Devices:

Function	Manufacturer	Model #	S/N
Remote Computer	Dell	DCNE	4FN1YC1
Remote Monitor	Dell	170817	CN-0K0789-732-AAQ
Remote Ethernet Hub	Linksys	5 Port 10/100	R91304 7001587 EB1040
Remote Mote	Dust Networks	Mote	1A D2

Test Conditions / Notes:

15.247 (d) Antenna Conducted Spurious Emissions Operating

EUT is 802.15.4 transmitter and is operating on the Low, Mid, and High channels as noted in the datasheet readings. The transmitter is transmitting continuously with modulation - Channel 0 Low = 2405 MHz, Channel 8 Mid = 2445 MHz, and Channel 15 High = 2480 MHz. The temperature was 22.3°C and the humidity was 35%. Frequency range investigated was 30 MHz to 25 GHz Lo Channel (0) operating.

This wireless mesh network has components to gather transducer signals that are coming from sensors that are mounted on industrial equipments and returns their respective signals back to a host computer to be used for maintenance and servicing of that equipment. The components include a Gateway Manager module, a number of MOTEs and Repeaters, the sensing transducer and wiring. The Gateway Manager module services as the data collection point as well as connection into the wireless mesh and relays the data over to a host computer system. Additionally, the Gateway Manager handles the management of the network communication link between the MOTEs and Repeater, and determines the path that the data takes through the network back to the Gateway Manager.

The Gateway Manager (part number 185510-01) is the main interface component that connects the wireless nodes (via MOTES and Repeaters) of the mesh network over to the computer system. The Gateway Manager can be operated as a single unit or in redundancy mod configuration. In the second mode, which is the mode under test,

two units are used and both are connected to the computer via each module's Ethernet ports and to one another via a serial port. The primary unit is in operational mode and second unit in stand-by mode. If the primary unit fails, then the secondary unit takes over the network responsibilities.

Ports:
Power input port is normally connected to external 24-volt DC supply power.
Ethernet Cat-5 is used between the Network hub or Computer and the Gateway Manager module.

Serial-1: RS-232 is only used in the Redundancy configuration and connects between the two Gateway Manager modules.

Serial-2: Normally is not connected to or used. This is a RS-232 link and this maintenance port is used by a GE service person and would be connected between the service computer and Gateway Manager module Unterminated serial cables are connected to the Serial-2 Ports.

Antenna interface uses a reverse style SMA connector on the Gateway Manager antenna connector interface port. There are two antenna configurations that can be connected to the Gateway Manager module. One is via a 2 dBi short antenna (rubber ducky) that is directly connected at the rear of the module and the second configuration uses a 75 feet antenna cable -4 dB with a 6 dBi antenna so that the wireless link can be mounted remotely. An in-line surge suppressor is mounted between the cable and the Gateway Manager module's antenna port. A 2 dBi antenna is connected to one of the EUT and the 6 dBi antenna is connected to the second EUT.

Rack Units

RBW = 100kHz VBW=100kHz

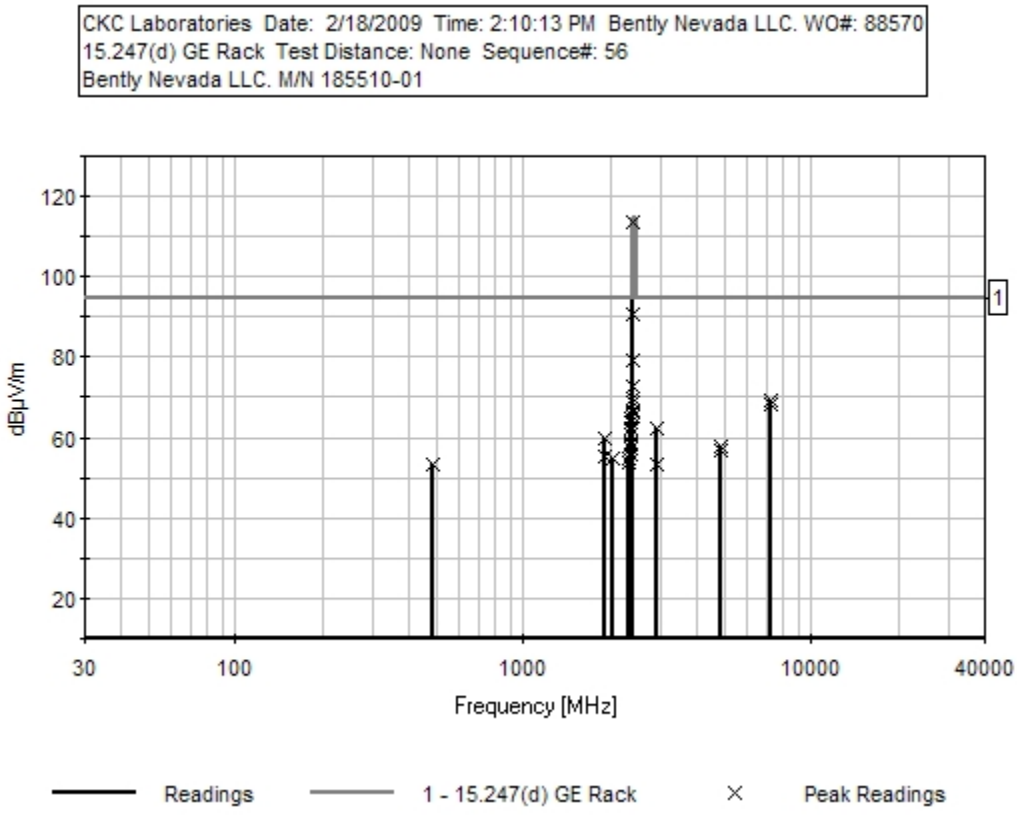
Transducer Legend:

T1=Cable ANP04276 25'

Measurement Data: Reading listed by margin. Test Distance: None

#	Freq MHz	Rdng dBµV	T1 dB	dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	2404.403M	111.1	+2.3				+0.0	113.4	114.5 Fundamental	-1.1	None
2	2408.407M	88.2	+2.3				+0.0	90.5	114.5	-24.0	None
3	2396.395M	67.4	+2.3				+0.0	69.7	94.5	-24.8	None
4	7216.210M	64.9	+4.4				+0.0	69.3	94.5	-25.2	None
5	2384.383M	66.4	+2.3				+0.0	68.7	94.5	-25.8	None
6	7213.207M	64.0	+4.4				+0.0	68.4	94.5	-26.1	None
7	2388.387M	64.5	+2.3				+0.0	66.8	94.5	-27.7	None
8	2391.390M	64.2	+2.3				+0.0	66.5	94.5	-28.0	None
9	2379.378M	62.9	+2.3				+0.0	65.2	94.5	-29.3	None
10	2375.374M	62.6	+2.3				+0.0	64.9	94.5	-29.6	None
11	2371.370M	61.7	+2.3				+0.0	64.0	94.5	-30.5	None

12	2367.366M	60.1	+2.3	+0.0	62.4	94.5	-32.1	None
13	2884.883M	59.9	+2.5	+0.0	62.4	94.5	-32.1	None
14	2363.362M	58.6	+2.3	+0.0	60.9	94.5	-33.6	None
15	1924.924M	57.6	+2.1	+0.0	59.7	94.5	-34.8	None
16	2400.399M	77.0	+2.3	+0.0	79.3	114.5	-35.2	None
17	2359.358M	56.6	+2.3	+0.0	58.9	94.5	-35.6	None
18	2346.345M	56.4	+2.2	+0.0	58.6	94.5	-35.9	None
19	2354.353M	56.0	+2.3	+0.0	58.3	94.5	-36.2	None
20	4807.804M	54.3	+3.5	+0.0	57.8	94.5	-36.7	None
21	2350.349M	54.8	+2.3	+0.0	57.1	94.5	-37.4	None
22	4811.808M	53.2	+3.5	+0.0	56.7	94.5	-37.8	None
23	2342.341M	53.6	+2.2	+0.0	55.8	94.5	-38.7	None
24	1921.921M	53.1	+2.0	+0.0	55.1	94.5	-39.4	None
25	2337.336M	52.7	+2.2	+0.0	54.9	94.5	-39.6	None
26	2032.031M	52.5	+2.2	+0.0	54.7	94.5	-39.8	None
27	2325.324M	51.4	+2.2	+0.0	53.6	94.5	-40.9	None
28	481.291M	52.6	+0.9	+0.0	53.5	94.5	-41.0	None
29	2887.886M	50.6	+2.5	+0.0	53.1	94.5	-41.4	None
30	2412.411M	70.3	+2.3	+0.0	72.6	114.5	-41.9	None


CKC Laboratories Date: 2/18/2009 Time: 2:10:13 PM Bently Nevada LLC. WO#: 88570
15.247(d) GE Rack Test Distance: None Sequence#: 56
Bently Nevada LLC. M/N 185510-01
120
100
80
60
40
20
dBµV/m
1
30
100
1000
10000
40000
Frequency [MHz]
Readings
1 - 15.247(d) GE Rack
Peak Readings

Test Location: CKC Laboratories •5046 Sierra Pines Dr. • Mariposa, CA 95338 • 209 966-5240

Customer:	**Bently Nevada LLC.**		
Specification:	**15.247(d) GE SA**		
Work Order #:	**88570**	Date:	2/18/2009
Test Type:	**Maximized Emissions**	Time:	10:49:43 AM
Equipment:	**Essential Insight.mesh Gateway Manager**	Sequence#:	52
Manufacturer:	Bently Nevada LLC.	Tested By:	Chuck Kendall
Model:	185511-01/179168-01		
S/N:	0-17-0D-00-00-30-B6		

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A	US443000407	08/07/2008	08/07/2010	02660
Cable, Andrews Hardline HF-005-20	NA	09/28/2007	09/28/2009	P04276

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Essential Insight.mesh Gateway Manager*	Bently Nevada LLC.	185511-01/179168-01	0-17-0D-00-00-30-B6
Essential Insight.mesh Gateway Manager	Bently Nevada LLC.	185511-01/179168-01	0-17-0D-00-00-2E-D9
DC Power Supply	Traco	TSP090-224-BM	20813126047
DC Power Supply	Traco	TSP090-224-BM	20813126391

Support Devices:

Function	Manufacturer	Model #	S/N
Remote Computer	Dell	DCNE	4FN1YC1
Remote Monitor	Dell	170817	CN-0K0789-732-AAQ
Remote Ethernet Hub	Linksys	5 Port 10/100	R91304 7001587 EB1040
Remote Mote	Dust Networks	Mote	1A D2

Test Conditions / Notes:

15.247 (d) Antenna Conducted Spurious Emissions Operating

EUT is 802.15.4 transmitter and is operating on the Low, Mid, and High channels as noted in the datasheet readings. The transmitter is transmitting continuously with modulation - Channel 0 Low = 2405 MHz, Channel 8 Mid = 2445 MHz, and Channel 15 High = 2480 MHz. The temperature was 22.3°C and the humidity was 35%. Frequency range investigated was 30 to 25 GHz Lo Channel (0) operating.

This wireless mesh network has components to gather transducer signals that are coming from sensors that are mounted on industrial equipments and returns their respective signals back to a host computer to be used for maintenance and servicing of that equipment. The components include a Gateway Manager module, a number of MOTEs and Repeaters, the sensing transducers and wiring. The Gateway Manager module service as the data collection point as well as connection into the wireless mesh and relays the data over to a host computer system. Additionally, the Gateway Manager handles the management of the network communication link between the MOTEs and Repeater, and determines the path that the data takes through the network back to the Gateway Manager.

The stand-alone Gateway Manager module is built from two base parts (part number 185511-01 with the interface base 179168-01) is the main interface component that connects the wireless nodes (via MOTES and Repeaters) of the mesh network over to the computer system. The Gateway Manager can be operated as a single unit or in

redundancy mode configuration. In the second mode two units are used and both are connected to the computer via each module's Ethernet ports and to one another via a serial port. The primary unit is in operational mode and second unit in stand-by. If the primary unit fails, then the secondary unit takes over the network responsibilities.

Ports:
Power input port is normally connected to external 24-volt DC supply power.

Ethernet Cat-5 is used between the Network hub or Computer and the Gateway Manager module.

Serial-1: RS-232 is only used in the Redundancy configuration and connects between the two Gateway Manager modules.

Some of the ports on the module are not normally used or are not connected to the Gateway Manager. These ports would normally have covers over them when they are installed at the customer site.

Serial-2: Normally is not connected to or used. This is a RS-232 link and this maintenance port is used by a GE service person and would be connected between the service computer and Gateway Manager module.

The stand-alone interface base is used for other modules and so some of the ports that are built into the base are neither used or are connected to the Gateway Manager module. The multi-pin for base-to-base connector interface is not connected to the Gateway Manager. Additionally, the top Ethernet port of the dual Ethernet port on the rear of the module is not connected to the Gateway Manager. These ports have been covered and are documented in the respective manuals.

Antenna interface uses a reverse style SMA connector on the Gateway Manager antenna connector interface port. There are two antenna configurations that can be connected to the Gateway Manager module. One is via a 2 dB small antenna (rubber ducky) that is directly connected at the rear of the module and the second configuration uses a 75 feet antenna cable -4 dB with a 6 dB antenna so that the wireless link can be mounted remotely. An in-line surge suppressor is mounted between the cable and the Gateway Manager module's antenna port.

Stand Alone Unit

RBW = 100 kHz VBW = 300 kHz

Transducer Legend:

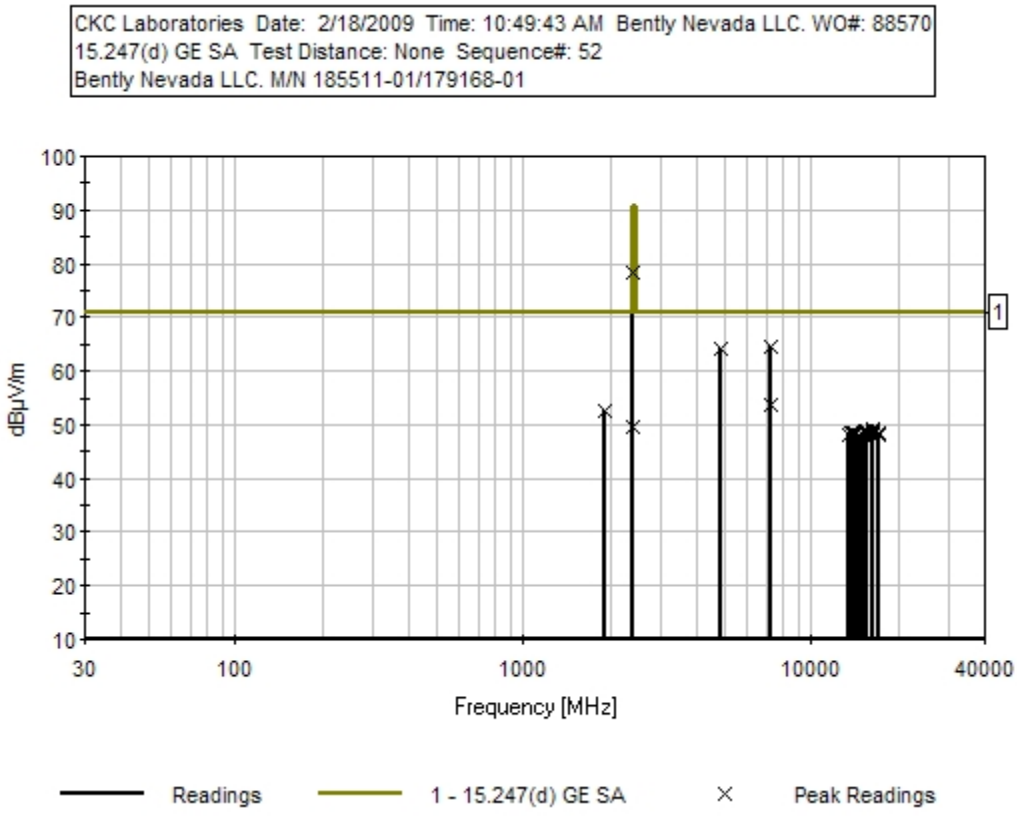
T1=Cable ANP04276 25'

Measurement Data: Reading listed by margin. Test Distance: None

#	Freq MHz	Rdng dBµV	T1 dB	dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	7216.210M	60.0	+4.4				+0.0	64.4	70.7	-6.3	None
2	4810.807M	60.6	+3.5				+0.0	64.1	70.7	-6.6	None
3	2406.405M	76.2	+2.3				+0.0	78.5	90.7	-12.2	None
4	7212.206M	49.4	+4.4				+0.0	53.8	70.7	-16.9	None
5	1923.923M	50.7	+2.0				+0.0	52.7	70.7	-18.0	None
6	2397.396M	47.4	+2.3				+0.0	49.7	70.7	-21.0	None

7	16354.340 M	42.3	+6.8	+0.0	49.1	70.7	-21.6	None
8	15385.370 M	42.6	+6.4	+0.0	49.0	70.7	-21.7	None
9	16302.290 M	42.4	+6.6	+0.0	49.0	70.7	-21.7	None
10	15518.500 M	42.3	+6.4	+0.0	48.7	70.7	-22.0	None
11	13768.760 M	42.9	+5.7	+0.0	48.6	70.7	-22.1	None
12	13825.810 M	42.9	+5.7	+0.0	48.6	70.7	-22.1	None
13	13942.930 M	42.9	+5.7	+0.0	48.6	70.7	-22.1	None
14	15486.470 M	42.1	+6.4	+0.0	48.5	70.7	-22.2	None
15	14127.110 M	42.6	+5.8	+0.0	48.4	70.7	-22.3	None
16	13647.630 M	42.5	+5.8	+0.0	48.3	70.7	-22.4	None
17	16321.310 M	41.6	+6.7	+0.0	48.3	70.7	-22.4	None
18	16402.390 M	41.4	+6.9	+0.0	48.3	70.7	-22.4	None
19	17272.820 M	42.1	+6.2	+0.0	48.3	70.7	-22.4	None
20	13424.410 M	42.4	+5.8	+0.0	48.2	70.7	-22.5	None
21	14545.530 M	42.1	+6.0	+0.0	48.1	70.7	-22.6	None
22	15567.550 M	41.8	+6.3	+0.0	48.1	70.7	-22.6	None
23	16429.410 M	41.2	+6.9	+0.0	48.1	70.7	-22.6	None
24	15077.060 M	41.5	+6.5	+0.0	48.0	70.7	-22.7	None

25	15179.170 M	41.5	+6.5	+0.0	48.0	70.7	-22.7	None
26	15530.520 M	41.6	+6.4	+0.0	48.0	70.7	-22.7	None
27	15599.580 M	41.7	+6.3	+0.0	48.0	70.7	-22.7	None
28	15618.600 M	41.7	+6.3	+0.0	48.0	70.7	-22.7	None
29	16318.300 M	41.3	+6.7	+0.0	48.0	70.7	-22.7	None
30	17133.100 M	41.7	+6.3	+0.0	48.0	70.7	-22.7	None



Test Location: CKC Laboratories •5046 Sierra Pines Dr. • Mariposa, CA 95338 • 209 966-5240

Customer:	**Bently Nevada LLC.**		
Specification:	**15.247(d) GE SA**		
Work Order #:	**88570**	Date:	2/18/2009
Test Type:	**Maximized Emissions**	Time:	10:43:17 AM
Equipment:	**Essential Insight.mesh Gateway Manager**	Sequence#:	51
Manufacturer:	Bently Nevada LLC.	Tested By:	Chuck Kendall
Model:	185511-01/179168-01		
S/N:	0-17-0D-00-00-30-B6		

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A	US443000407	08/07/2008	08/07/2010	02660
Cable, Andrews Hardline HF-005-20	NA	09/28/2007	09/28/2009	P04276

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Essential Insight.mesh Gateway Manager*	Bently Nevada LLC.	185511-01/179168-01	0-17-0D-00-00-30-B6
Essential Insight.mesh Gateway Manager	Bently Nevada LLC.	185511-01/179168-01	0-17-0D-00-00-2E-D9
DC Power Supply	Traco	TSP090-224-BM	20813126047
DC Power Supply	Traco	TSP090-224-BM	20813126391

Support Devices:

Function	Manufacturer	Model #	S/N
Remote Computer	Dell	DCNE	4FN1YC1
Remote Monitor	Dell	170817	CN-0K0789-732-AAQ
Remote Ethernet Hub	Linksys	5 Port 10/100	R91304 7001587 EB1040
Remote Mote	Dust Networks	Mote	1A D2

Test Conditions / Notes:

15.247 (d) Antenna Conducted Spurious Emissions Operating

EUT is 802.15.4 transmitter and is operating on the Low, Mid, and High channels as noted in the datasheet readings. The transmitter is transmitting continuously with modulation - Channel 0 Low = 2405 MHz, Channel 8 Mid = 2445 MHz, and Channel 15 High = 2480 MHz. The temperature was 22.3°C and the humidity was 35%. Frequency range investigated was 30 to 25 GHz Mid Channel (8) operating.

This wireless mesh network has components to gather transducer signals that are coming from sensors that are mounted on industrial equipments and returns their respective signals back to a host computer to be used for maintenance and servicing of that equipment. The components include a Gateway Manager module, a number of MOTEs and Repeaters, the sensing transducers and wiring. The Gateway Manager module service as the data collection point as well as connection into the wireless mesh and relays the data over to a host computer system. Additionally, the Gateway Manager handles the management of the network communication link between the MOTEs and Repeater, and determines the path that the data takes through the network back to the Gateway Manager.

The stand-alone Gateway Manager module is built from two base parts (part number 185511-01 with the interface base 179168-01) is the main interface component that connects the wireless nodes (via MOTES and Repeaters) of the mesh network over to the computer system. The Gateway Manager can be operated as a single unit or in

redundancy mode configuration. In the second mode two units are used and both are connected to the computer via each module's Ethernet ports and to one another via a serial port. The primary unit is in operational mode and second unit in stand-by. If the primary unit fails, then the secondary unit takes over the network responsibilities.

Ports:
Power input port is normally connected to external 24-volt DC supply power.

Ethernet Cat-5 is used between the Network hub or Computer and the Gateway Manager module.

Serial-1: RS-232 is only used in the Redundancy configuration and connects between the two Gateway Manager modules.

Some of the ports on the module are not normally used or are not connected to the Gateway Manager. These ports would normally have covers over them when they are installed at the customer site.

Serial-2: Normally is not connected to or used. This is a RS-232 link and this maintenance port is used by a GE service person and would be connected between the service computer and Gateway Manager module.

The stand-alone interface base is used for other modules and so some of the ports that are built into the base are neither used or are connected to the Gateway Manager module. The multi-pin for base-to-base connector interface is not connected to the Gateway Manager. Additionally, the top Ethernet port of the dual Ethernet port on the rear of the module is not connected to the Gateway Manager. These ports have been covered and are documented in the respective manuals.

Antenna interface uses a reverse style SMA connector on the Gateway Manager antenna connector interface port. There are two antenna configurations that can be connected to the Gateway Manager module. One is via a 2 dB small antenna (rubber ducky) that is directly connected at the rear of the module and the second configuration uses a 75 feet antenna cable -4 dB with a 6 dB antenna so that the wireless link can be mounted remotely. An in-line surge suppressor is mounted between the cable and the Gateway Manager module's antenna port.

Stand Alone Unit

RBW = 100 kHz VBW = 300 kHz

Transducer Legend:

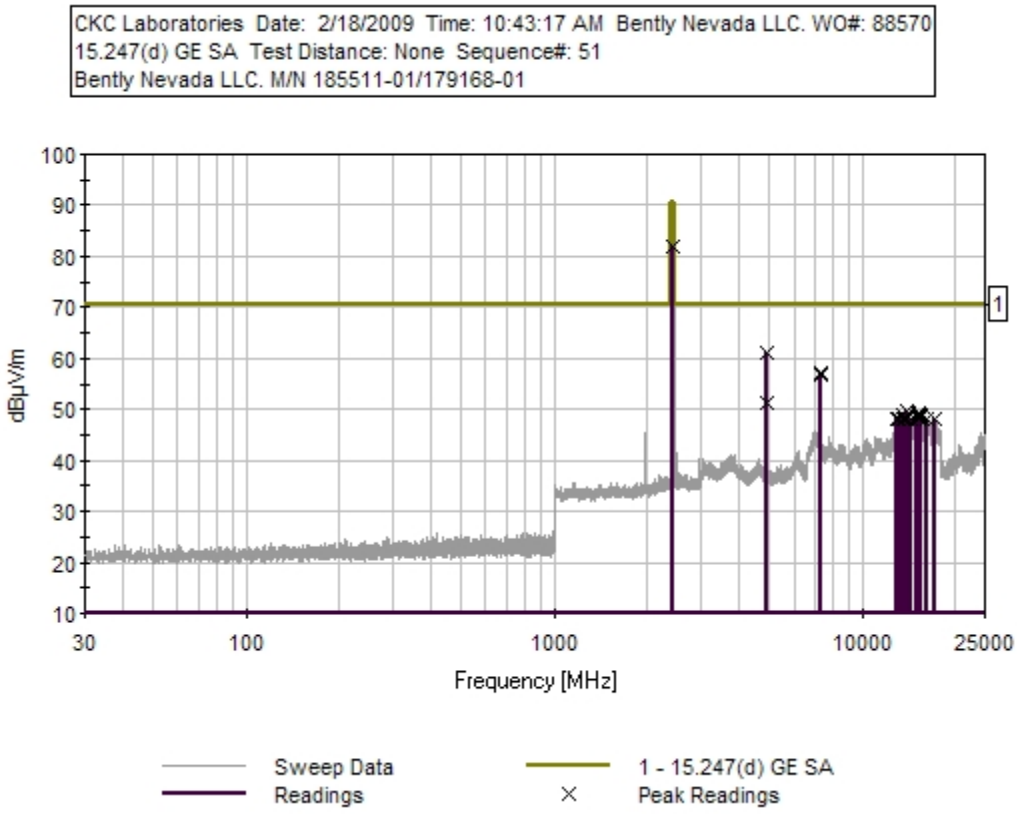
T1=Cable ANP04276 25'

Measurement Data: Reading listed by margin. Test Distance: None

#	Freq MHz	Rdng dBµV	T1 dB	dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	2446.445M	79.5	+2.3				+0.0	81.8	90.7	-8.9	None
2	4888.885M	57.7	+3.4				+0.0	61.1	70.7	-9.6	None
3	7336.330M	53.0	+4.3				+0.0	57.3	70.7	-13.4	None
4	7333.327M	52.3	+4.3				+0.0	56.6	70.7	-14.1	None
5	4891.888M	47.8	+3.4				+0.0	51.2	70.7	-19.5	None
6	13910.900 M	43.8	+5.7				+0.0	49.5	70.7	-21.2	None

7	15235.220 M	42.8	+6.5	+0.0	49.3	70.7	-21.4	None
8	14091.080 M	43.4	+5.8	+0.0	49.2	70.7	-21.5	None
9	15612.600 M	42.7	+6.3	+0.0	49.0	70.7	-21.7	None
10	15214.200 M	42.4	+6.5	+0.0	48.9	70.7	-21.8	None
11	13561.550 M	43.0	+5.8	+0.0	48.8	70.7	-21.9	None
12	15247.230 M	42.2	+6.5	+0.0	48.7	70.7	-22.0	None
13	15598.580 M	42.4	+6.3	+0.0	48.7	70.7	-22.0	None
14	15344.330 M	42.2	+6.4	+0.0	48.6	70.7	-22.1	None
15	13808.800 M	42.8	+5.7	+0.0	48.5	70.7	-22.2	None
16	15253.240 M	42.1	+6.4	+0.0	48.5	70.7	-22.2	None
17	15293.280 M	42.1	+6.4	+0.0	48.5	70.7	-22.2	None
18	15145.130 M	41.9	+6.5	+0.0	48.4	70.7	-22.3	None
19	13063.050 M	42.8	+5.5	+0.0	48.3	70.7	-22.4	None
20	13705.690 M	42.5	+5.8	+0.0	48.3	70.7	-22.4	None
21	15168.150 M	41.8	+6.5	+0.0	48.3	70.7	-22.4	None
22	13633.620 M	42.4	+5.8	+0.0	48.2	70.7	-22.5	None
23	13736.720 M	42.4	+5.8	+0.0	48.2	70.7	-22.5	None
24	14440.430 M	42.2	+6.0	+0.0	48.2	70.7	-22.5	None

25	14450.440 M	42.2	+6.0	+0.0	48.2	70.7	-22.5	None
26	15189.170 M	41.7	+6.5	+0.0	48.2	70.7	-22.5	None
27	13030.020 M	42.6	+5.5	+0.0	48.1	70.7	-22.6	None
28	13695.680 M	42.2	+5.8	+0.0	48.0	70.7	-22.7	None
29	16306.290 M	41.4	+6.6	+0.0	48.0	70.7	-22.7	None
30	17239.370 M	41.7	+6.3	+0.0	48.0	70.7	-22.7	None



Test Location: CKC Laboratories •5046 Sierra Pines Dr. • Mariposa, CA 95338 • 209 966-5240

Customer:	**Bently Nevada LLC.**		
Specification:	**15.247(d) GE SA**		
Work Order #:	**88570**	Date:	2/18/2009
Test Type:	**Maximized Emissions**	Time:	10:37:32 AM
Equipment:	**Essential Insight.mesh Gateway Manager**	Sequence#:	50
Manufacturer:	Bently Nevada LLC.	Tested By:	Chuck Kendall
Model:	185511-01/179168-01		
S/N:	0-17-0D-00-00-30-B6		

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A	US443000407	08/07/2008	08/07/2010	02660
Cable, Andrews Hardline HF-005-20	NA	09/28/2007	09/28/2009	P04276

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Essential Insight.mesh Gateway Manager*	Bently Nevada LLC.	185511-01/179168-01	0-17-0D-00-00-30-B6
Essential Insight.mesh Gateway Manager	Bently Nevada LLC.	185511-01/179168-01	0-17-0D-00-00-2E-D9
DC Power Supply	Traco	TSP090-224-BM	20813126047
DC Power Supply	Traco	TSP090-224-BM	20813126391

Support Devices:

Function	Manufacturer	Model #	S/N
Remote Computer	Dell	DCNE	4FN1YC1
Remote Monitor	Dell	170817	CN-0K0789-732-AAQ
Remote Ethernet Hub	Linksys	5 Port 10/100	R91304 7001587 EB1040
Remote Mote	Dust Networks	Mote	1A D2

Test Conditions / Notes:

15.247 (d) Antenna Conducted Spurious Emissions Operating

EUT is 802.15.4 transmitter and is operating on the Low, Mid, and High channels as noted in the datasheet readings. The transmitter is transmitting continuously with modulation - Channel 0 Low = 2405 MHz, Channel 8 Mid = 2445 MHz, and Channel 15 High = 2480 MHz. The temperature was 22.3°C and the humidity was 35%. Frequency range investigated was 30 to 25 GHz High Channel (15) operating.

This wireless mesh network has components to gather transducer signals that are coming from sensors that are mounted on industrial equipments and returns their respective signals back to a host computer to be used for maintenance and servicing of that equipment. The components include a Gateway Manager module, a number of MOTEs and Repeaters, the sensing transducers and wiring. The Gateway Manager module service as the data collection point as well as connection into the wireless mesh and relays the data over to a host computer system. Additionally, the Gateway Manager handles the management of the network communication link between the MOTEs and Repeater, and determines the path that the data takes through the network back to the Gateway Manager.

The stand-alone Gateway Manager module is built from two base parts (part number 185511-01 with the interface base 179168-01) is the main interface component that connects the wireless nodes (via MOTES and Repeaters) of the mesh network over to the computer system. The Gateway Manager can be operated as a single unit or in

redundancy mode configuration. In the second mode two units are used and both are connected to the computer via each module's Ethernet ports and to one another via a serial port. The primary unit is in operational mode and second unit in stand-by. If the primary unit fails, then the secondary unit takes over the network responsibilities.

Ports:
Power input port is normally connected to external 24-volt DC supply power.

Ethernet Cat-5 is used between the Network hub or Computer and the Gateway Manager module.

Serial-1: RS-232 is only used in the Redundancy configuration and connects between the two Gateway Manager modules.

Some of the ports on the module are not normally used or are not connected to the Gateway Manager. These ports would normally have covers over them when they are installed at the customer site.

Serial-2: Normally is not connected to or used. This is a RS-232 link and this maintenance port is used by a GE service person and would be connected between the service computer and Gateway Manager module.

The stand-alone interface base is used for other modules and so some of the ports that are built into the base are neither used or are connected to the Gateway Manager module. The multi-pin for base-to-base connector interface is not connected to the Gateway Manager. Additionally, the top Ethernet port of the dual Ethernet port on the rear of the module is not connected to the Gateway Manager. These ports have been covered and are documented in the respective manuals.

Antenna interface uses a reverse style SMA connector on the Gateway Manager antenna connector interface port. There are two antenna configurations that can be connected to the Gateway Manager module. One is via a 2 dB small antenna (rubber ducky) that is directly connected at the rear of the module and the second configuration uses a 75 feet antenna cable -4 dB with a 6 dB antenna so that the wireless link can be mounted remotely. An in-line surge suppressor is mounted between the cable and the Gateway Manager module's antenna port.

Stand Alone Unit

RBW = 100 kHz VBW = 300 kHz

Transducer Legend:

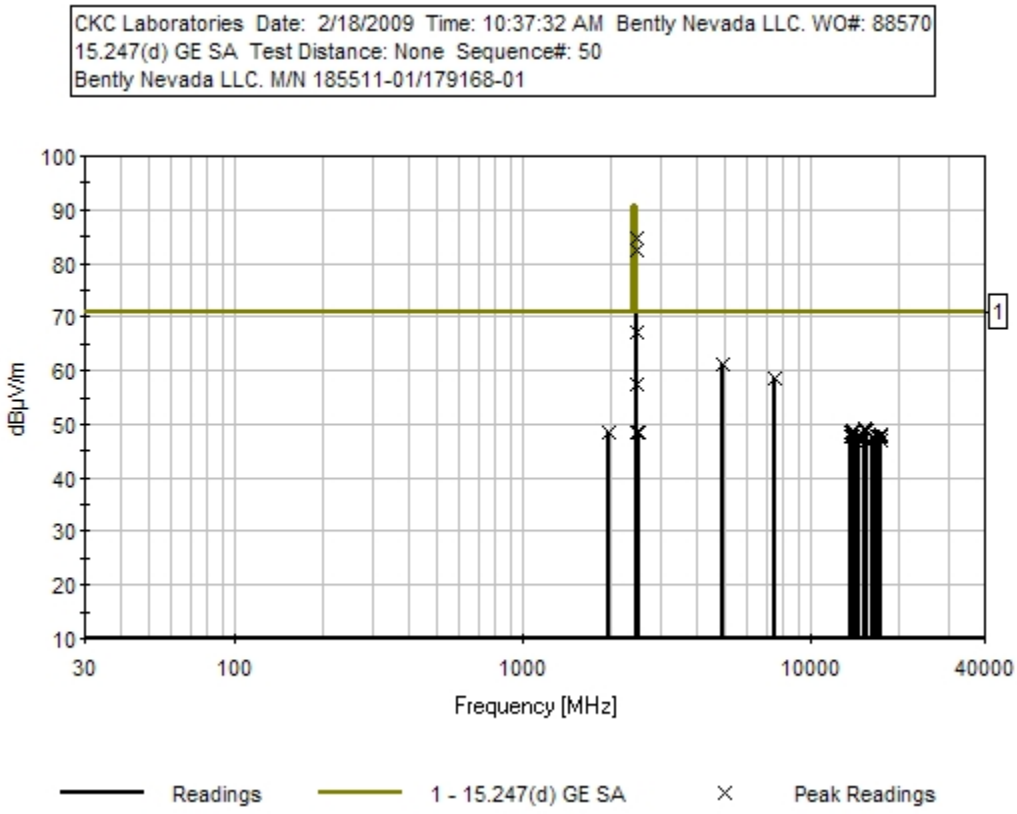
T1=Cable ANP04276 25'

Measurement Data: Reading listed by margin. Test Distance: None

#	Freq MHz	Rdng dBµV	T1 dB	dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	2484.126M	64.9	+2.4				+0.0	67.3	70.7 Fundamental	-3.4	None
2	2479.283M	82.2	+2.4				+0.0	84.6	90.7	-6.1	None
3	2481.358M	80.1	+2.4				+0.0	82.5	90.7	-8.2	None
4	4960.587M	57.8	+3.5				+0.0	61.3	70.7	-9.4	None
5	7438.452M	54.3	+4.2				+0.0	58.5	70.7	-12.2	None
6	2486.893M	55.0	+2.4				+0.0	57.4	70.7	-13.3	None

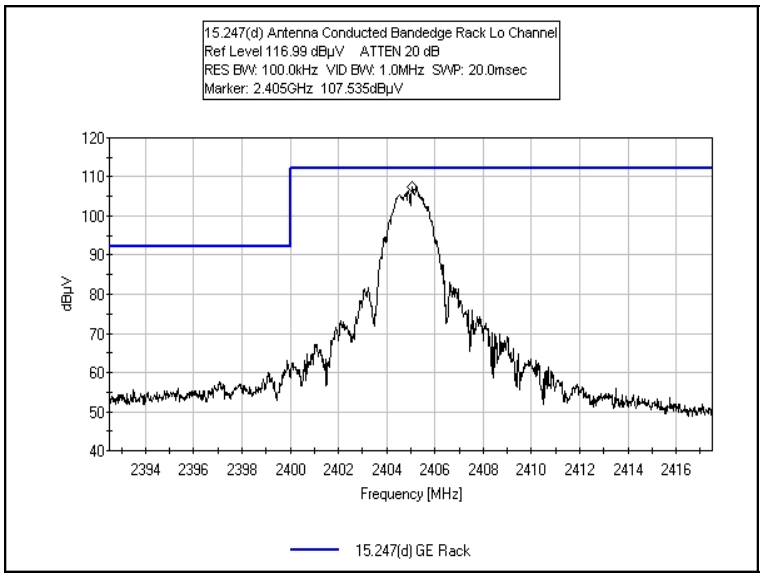
7	15282.880 M	42.7	+6.4	+0.0	49.1	70.7	-21.6	None
8	15309.010 M	42.4	+6.4	+0.0	48.8	70.7	-21.9	None
9	15537.610 M	42.4	+6.4	+0.0	48.8	70.7	-21.9	None
10	13966.180 M	43.0	+5.7	+0.0	48.7	70.7	-22.0	None
11	2489.660M	46.2	+2.4	+0.0	48.6	70.7	-22.1	None
12	13879.290 M	42.9	+5.7	+0.0	48.6	70.7	-22.1	None
13	13938.370 M	42.9	+5.7	+0.0	48.6	70.7	-22.1	None
14	1982.780M	46.3	+2.2	+0.0	48.5	70.7	-22.2	None
15	2499.346M	46.1	+2.4	+0.0	48.5	70.7	-22.2	None
16	13622.120 M	42.5	+5.8	+0.0	48.3	70.7	-22.4	None
17	17281.530 M	42.0	+6.2	+0.0	48.2	70.7	-22.5	None
18	13712.480 M	42.1	+5.8	+0.0	47.9	70.7	-22.8	None
19	13854.960 M	42.2	+5.7	+0.0	47.9	70.7	-22.8	None
20	15260.020 M	41.4	+6.4	+0.0	47.8	70.7	-22.9	None
21	14334.570 M	41.8	+5.9	+0.0	47.7	70.7	-23.0	None
22	16285.470 M	41.1	+6.6	+0.0	47.7	70.7	-23.0	None
23	17108.450 M	41.3	+6.3	+0.0	47.6	70.7	-23.1	None
24	17435.020 M	41.4	+6.2	+0.0	47.6	70.7	-23.1	None
25	17147.630 M	41.2	+6.3	+0.0	47.5	70.7	-23.2	None

26	16478.150 M	40.4	+7.0	+0.0	47.4	70.7	-23.3	None
27	16357.320 M	40.5	+6.8	+0.0	47.3	70.7	-23.4	None
28	14716.860 M	40.7	+6.2	+0.0	46.9	70.7	-23.8	None
29	14216.400 M	41.0	+5.8	+0.0	46.8	70.7	-23.9	None
30	17408.900 M	40.6	+6.2	+0.0	46.8	70.7	-23.9	None

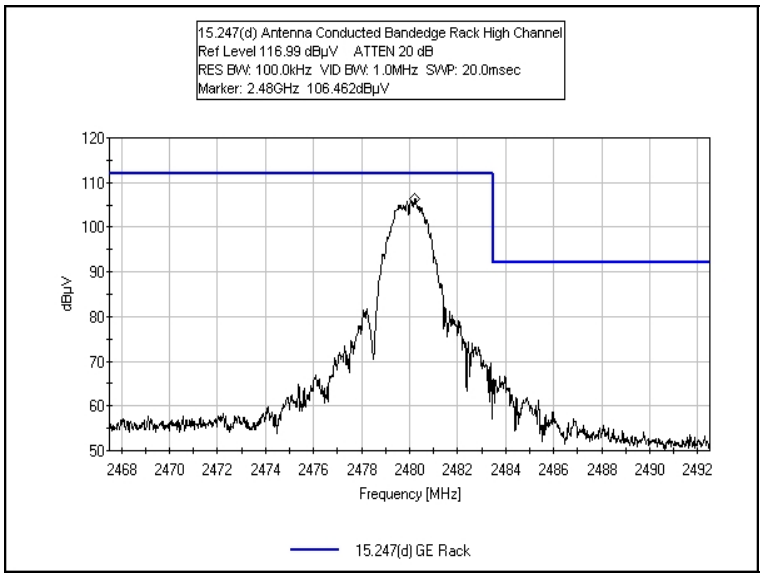


Test Plots

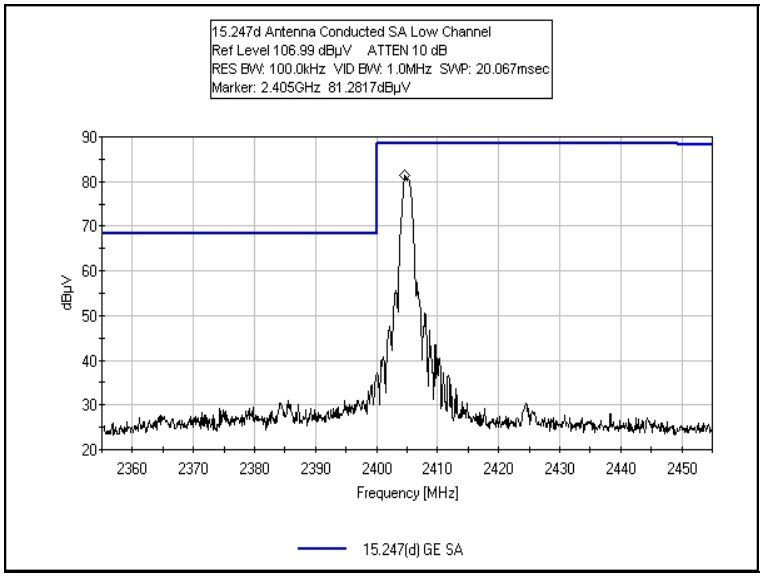
FCC 15.247(d) ANTENNA CONDUCTED BANDEDGE RACK LOW CHANNEL



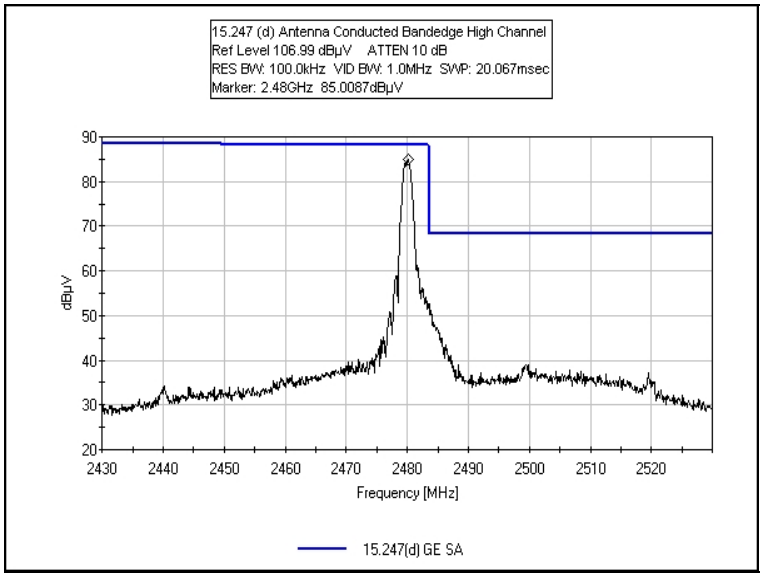
FCC 15.247(d) ANTENNA CONDUCTED BANDEDGE RACK HIGH CHANNEL



FCC 15.247(d) ANTENNA CONDUCTED BANDEDGE STAND ALONE LOW CHANNEL

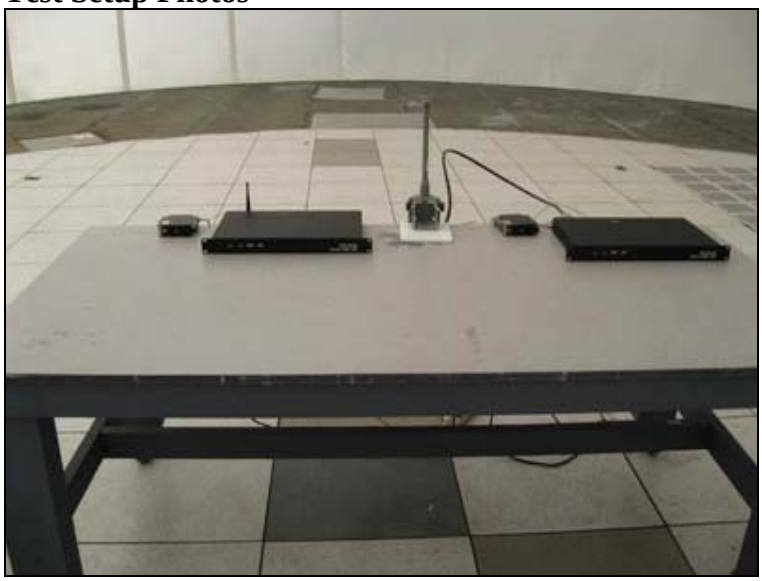


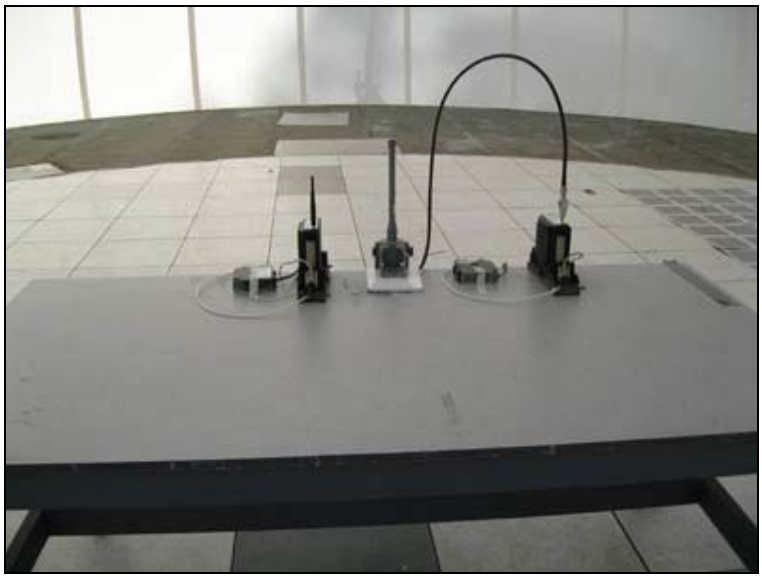
FCC 15.247(d) ANTENNA CONDUCTED BANDEDGE STAND ALONE HIGH CHANNEL

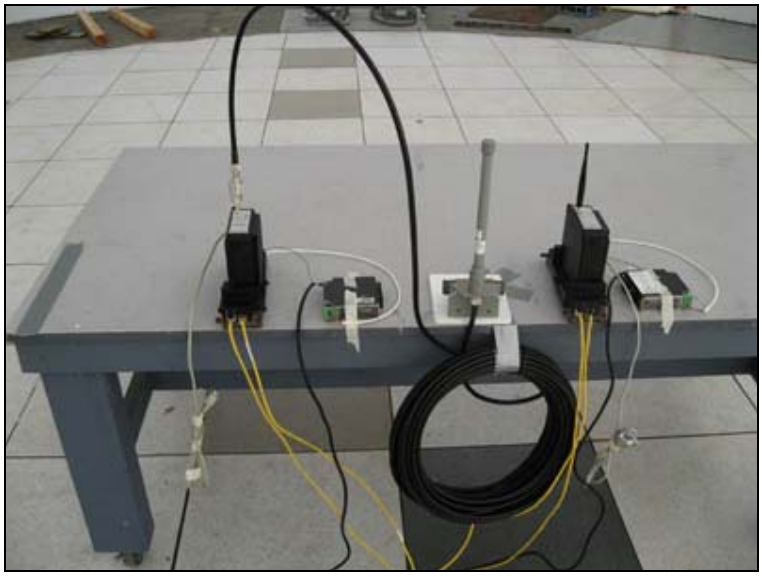


FCC 15.247(d) – OATS RADIATED SPURIOUS EMISSIONS

Test Setup Photos







Test Data Sheets

Test Location:	CKC Laboratories •5046 Sierra Pines Dr. • Mariposa, CA 95338 • 209 966-5240		
Customer:	**Bently Nevada LLC.**		
Specification:	**FCC 15.209/15.247(d)**		
Work Order #:	**88570**	Date:	2/12/2009
Test Type:	**Maximized Emissions**	Time:	09:37:06
Equipment:	**Essential Insight.mesh Gateway Manager**	Sequence#:	27
Manufacturer:	Bently Nevada LLC.	Tested By:	Chuck Kendall
Model:	185510-01		
S/N:	0-17-0D-00-00-30-C4		

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A	US443000407	08/07/2008	08/07/2010	02660
EMCO Loop Antenna	1074	05/01/2007	05/01/2009	00226
10m site A cable	N.A	05/11/2007	05/11/2009	MA10m

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Essential Insight.mesh Gateway Manager	Bently Nevada LLC.	185510-01	0-17-0D-00-00-2D-99
Essential Insight.mesh Gateway Manager*	Bently Nevada LLC.	185510-01	0-17-0D-00-00-30-C4
DC Power Supply	Traco	TSP090-224-BM	20813126047
DC Power Supply	Traco	TSP090-224-BM	20813126391

Support Devices:

Function	Manufacturer	Model #	S/N
Remote Computer	Dell	DCNE	4FN1YC1
Remote Monitor	Dell	170817	CN-0K0789-732-AAQ
Remote Ethernet Hub	Linksys	5 Port 10/100	R91304 7001587 EB1040
Remote Mote	Dust Networks	Mote	1A D2
Omni-Directional Antenna with 75' of Coax	HyperLink	HGGB2406U	NA
Small Omni-Directional Antenna	Laird/Aerocomm	0600-00014	NA

Test Conditions / Notes:

FCC 15.209/15.247(d) Magnetic

This wireless mesh network has components to gather transducer signals that are coming from sensors that are mounted on industrial equipments and returns their respective signals back to a host computer to be used for maintenance and servicing of that equipment. The components include a Gateway Manager module, a number of MOTEs and Repeaters, the sensing transducers and wiring. The Gateway Manager module service as the data collection point as well as connection into the wireless mesh and relays the data over to a host computer system. Additionally, the Gateway Manager handles the management of the network communication link between the MOTEs and Repeater, and determines the path that the data takes through the network back to the Gateway Manager.

The stand-alone Gateway Manager module is built from two base parts (part number 185511-01 with the interface base 179168-01) is the main interface component that connects the wireless nodes (via MOTES and Repeaters) of the mesh network over to the computer system. The Gateway Manager can be operated as a single unit or in redundancy mode configuration. In the second mode two units are used and both are connected to the computer via

each module's Ethernet ports and to one another via a serial port. The primary unit is in operational mode and second unit in stand-by. If the primary unit fails, then the secondary unit takes over the network responsibilities.

Ports:
Power input port is normally connected to external 24-volt DC supply power.

Ethernet Cat-5 is used between the Network hub or Computer and the Gateway Manager module.

Serial-1: RS-232 is only used in the Redundancy configuration and connects between the two Gateway Manager modules.

Some of the ports on the module are not normally used or are not connected to the Gateway Manager. These ports would normally have covers over them when they are installed at the customer site.

Serial-2: Normally is not connected to or used. This is a RS-232 link and this maintenance port is used by a GE service person and would be connected between the service computer and Gateway Manager module.

The stand-alone interface base is used for other modules and so some of the ports that are built into the base are neither used or are connected to the Gateway Manager module. The multi-pin for base-to-base connector interface is not connected to the Gateway Manager. Additionally, the top Ethernet port of the dual Ethernet port on the rear of the module is not connected to the Gateway Manager. These ports have been covered and are documented in the respective manuals.

Antenna interface uses a reverse style SMA connector on the Gateway Manager antenna connector interface port. There are two antenna configurations that can be connected to the Gateway Manager module. One is via a 2 dB small antenna (rubber ducky) that is directly connected at the rear of the module and the second configuration uses a 75 feet antenna cable -4 dB with a 6 dB antenna so that the wireless link can be mounted remotely. An in-line surge suppressor is mounted between the cable and the Gateway Manager module's antenna port.

Rack Units

Frequencies investigated were from 9kHz to 30 MHz

The temperature was 21.9°C and the humidity was 45%.
RBW = 9 kHz VBW = 30 kHz

Transducer Legend:

T1=MA10M	T2=Mag Loop - AN 00226 - 9kHz-30M

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	1.660M QP	51.3	+0.4	+10.0			-40.0	21.7	23.1	-1.4	Vert
^	1.659M	52.9	+0.4	+10.0			-40.0	23.3	23.1	+0.2	Vert
3	1.062M	53.1	+0.3	+10.1			-40.0	23.5	27.0	-3.5	Vert
4	791.846k	53.7	+0.3	+10.0			-40.0	24.0	29.6	-5.6	Vert
5	5.349M	51.7	+0.7	+9.9			-40.0	22.3	29.5	-7.2	Vert
6	940.285k	49.1	+0.3	+10.1			-40.0	19.5	28.1	-8.6	Vert

7	1.480M	44.8	+0.4	+10.0	-40.0	15.2	24.1	-8.9	Vert
8	1.599M	44.0	+0.4	+10.0	-40.0	14.4	23.5	-9.1	Vert
9	1.390M	43.1	+0.4	+10.0	-40.0	13.5	24.7	-11.2	Vert
10	580.685k	49.8	+0.2	+10.0	-40.0	20.0	32.3	-12.3	Vert
11	1.680M	40.2	+0.4	+10.0	-40.0	10.6	23.0	-12.4	Vert
12	1.331M	41.8	+0.4	+10.0	-40.0	12.2	25.1	-12.9	Vert
13	17.439M	44.8	+1.6	+9.0	-40.0	15.4	29.5	-14.1	Vert
14	1.432M	39.4	+0.4	+10.0	-40.0	9.8	24.4	-14.6	Vert
15	1.181M	40.3	+0.3	+10.1	-40.0	10.7	26.1	-15.4	Vert
16	1.250M	39.6	+0.3	+10.1	-40.0	10.0	25.6	-15.6	Vert
17	1.302M	39.0	+0.3	+10.1	-40.0	9.4	25.3	-15.9	Vert
18	1.131M	38.9	+0.3	+10.1	-40.0	9.3	26.5	-17.2	Vert
19	1.551M	36.1	+0.4	+10.0	-40.0	6.5	23.7	-17.2	Vert
20	1.363M	36.9	+0.4	+10.0	-40.0	7.3	24.9	-17.6	Vert
21	1.509M	35.5	+0.4	+10.0	-40.0	5.9	24.0	-18.1	Vert
22	620.408k	42.9	+0.2	+10.0	-40.0	13.1	31.7	-18.6	Vert
23	900.562k	39.5	+0.3	+10.1	-40.0	9.9	28.5	-18.6	Vert
24	980.009k	38.7	+0.3	+10.1	-40.0	9.1	27.7	-18.6	Vert
25	1.011M	36.8	+0.3	+10.1	-40.0	7.2	27.5	-20.3	Vert
26	7.448M	38.5	+0.9	+9.8	-40.0	9.2	29.5	-20.3	Vert
27	1.120M	35.2	+0.3	+10.1	-40.0	5.6	26.6	-21.0	Vert
28	1.091M	34.2	+0.3	+10.1	-40.0	4.6	26.8	-22.2	Vert
29	29.681M	37.9	+2.1	+5.8	-40.0	5.8	29.5	-23.7	Vert
30	1.450M	30.0	+0.4	+10.0	-40.0	0.4	24.3	-23.9	Vert
31	549.324k	38.2	+0.2	+10.0	-40.0	8.4	32.8	-24.4	Vert

Test Location:	CKC Laboratories •5046 Sierra Pines Dr. • Mariposa, CA 95338 • 209 966-5240		
Customer:	**Bently Nevada LLC.**		
Specification:	**FCC 15.209/15.247(d)**		
Work Order #:	**88570**	Date:	2/3/2009
Test Type:	**Maximized Emissions**	Time:	15:43:42
Equipment:	**Essential Insight.mesh Gateway Manager**	Sequence#:	1
Manufacturer:	Bently Nevada LLC.	Tested By:	Chuck Kendall
Model:	185510-01		
S/N:	0-17-0D-00-00-2D-99 & 0-17-0D-00-00-30-C4		

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP8593EM	3624A00159	03/23/2007	03/23/2009	02111
Bilog Antenna	2455	04/27/2007	04/27/2009	01992
HP-8447D Preamp	2727A05444	06/20/2008	06/20/2010	00062
Site A 10 meter cable set		05/11/2007	05/11/2009	MA10M

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Essential Insight.mesh Gateway Manager*	Bently Nevada LLC.	185510-01	0-17-0D-00-00-2D-99
Essential Insight.mesh Gateway Manager	Bently Nevada LLC.	185510-01	0-17-0D-00-00-30-C4

Support Devices:

Function	Manufacturer	Model #	S/N
Remote Computer	Dell	DCNE	4FN1YC1
Remote Monitor	Dell	170817	CN-0K0789-732-AAQ
Remote Ethernet Hub	Linksys	5 Port 10/100	R91304 7001587 EB1040
Remote Mote	Dust Networks	Mote	1A D2
Omni-Directional Antenna with 75' of Coax	HyperLink	HGGB2406U	NA
Small Omni-Directional Antenna	Laird/Aerocomm	0600-00014	NA

Test Conditions / Notes:

FCC 15.209/15.247(d)
This wireless mesh network has components to gather transducer signals that are coming from sensors that are mounted on industrial equipments and returns their respective signals back to a host computer to be used for maintenance and servicing of that equipment. The components include a Gateway Manager module, a number of MOTEs and Repeaters, the sensing transducer and wiring. The Gateway Manager module services as the data collection point as well as connection into the wireless mesh and relays the data over to a host computer system. Additionally, the Gateway Manager handles the management of the network communication link between the MOTEs and Repeater, and determines the path that the data takes through the network back to the Gateway Manager.

The Gateway Manager (part number 185510-01) is the main interface component that connects the wireless nodes (via MOTES and Repeaters) of the mesh network over to the computer system. The Gateway Manager can be operated as a single unit or in redundancy mod configuration. In the second mode, which is the mode under test, two units are used and both are connected to the computer via each module's Ethernet ports and to one another via a serial port. The primary unit is in operational mode and second unit in stand-by mode. If the primary unit fails,

then the secondary unit takes over the network responsibilities.

Ports:
Power input port is normally connected to external 24-volt DC supply power.
Ethernet Cat-5 is used between the Network hub or Computer and the Gateway Manager module.

Serial-1: RS-232 is only used in the Redundancy configuration and connects between the two Gateway Manager modules.

Serial-2: Normally is not connected to or used. This is a RS-232 link and this maintenance port is used by a GE service person and would be connected between the service computer and Gateway Manager module Unterminated serial cables are connected to the Serial-2 Ports.

Antenna interface uses a reverse style SMA connector on the Gateway Manager antenna connector interface port. There are two antenna configurations that can be connected to the Gateway Manager module. One is via a 2 dBi short antenna (rubber ducky) that is directly connected at the rear of the module and the second configuration uses a 75 feet antenna cable -4 dB with a 6 dBi antenna so that the wireless link can be mounted remotely. An in-line surge suppressor is mounted between the cable and the Gateway Manager module's antenna port. A 2 dBi antenna is connected to one of the EUT and the 6 dBi antenna is connected to the second EUT.

The 802.15.4 transceivers in each of the EUTs are in the receive mode.

The frequency range investigated was 30-1000 MHz.
The temperature was 21.9°C and the humidity was 45%.
RBW = 120 kHz VBW = 300 kHz

Transducer Legend:

T1=AMP-AN00062-062008 T2=ANT AN01992 25-1000MHz
T3=MA10M

Measurement Data: Reading listed by margin. Test Distance: 10 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	250.005M	34.8	-29.8	+12.7	+3.7		+10.0	31.4	46.0	-14.6	Vert
2	350.003M	29.0	-29.8	+15.2	+4.7		+10.0	29.1	46.0	-16.9	Horiz
3	275.008M	31.2	-29.7	+13.2	+4.0		+10.0	28.7	46.0	-17.3	Vert
4	225.005M	34.0	-29.8	+10.9	+3.5		+10.0	28.6	46.0	-17.4	Vert
5	200.003M	33.2	-30.0	+8.8	+3.3		+10.0	25.3	43.5	-18.2	Horiz
6	300.003M	27.6	-29.7	+13.7	+4.2		+10.0	25.8	46.0	-20.2	Horiz

Test Location: CKC Laboratories •5046 Sierra Pines Dr. • Mariposa, CA 95338 • 209 966-5240

Customer:	**Bently Nevada LLC.**		
Specification:	**15.247(d)/15.209**		
Work Order #:	**88570**	Date:	2/9/2009
Test Type:	**Maximized Emissions**	Time:	16:00:40
Equipment:	**Essential Insight.mesh Gateway Manager**	Sequence#:	53
Manufacturer:	Bently Nevada LLC.	Tested By:	Chuck Kendall
Model:	185510-01		
S/N:	0-17-0D-00-00-2D-99/0-17-0D-00-00-30-C4		

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A	US443000407	08/07/2008	08/07/2010	02660
40dB pre amp	9002	03/20/2007	03/20/2009	AN02114
EMCO 3115 Horn Antenna	9006-3413	06/06/2008	06/06/2010	327
3 GHz HP Filter	N/A	05/14/2007	05/14/2009	AN01440
Cable, Andrews Hardline HF-005-20	NA	09/28/2007	09/28/2009	P04276
Cable, WL Gore 2'	149047	05/09/2007	05/09/2009	P01527
Cable, Andrews Hardline HF-005-20	NA	09/04/2007	09/04/2009	P05346

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Essential Insight.mesh Gateway Manager*	Bently Nevada LLC.	185510-01	0-17-0D-00-00-2D-99
Essential Insight.mesh Gateway Manager	Bently Nevada LLC.	185510-01	0-17-0D-00-00-30-C4
DC Power Supply	Traco	TSP090-224-BM	20813126047
DC Power Supply	Traco	TSP090-224-BM	20813126047

Support Devices:

Function	Manufacturer	Model #	S/N
Remote Computer	Dell	DCNE	4FN1YC1
Remote Monitor	Dell	170817	CN-0K0789-732-AAQ
Remote Ethernet Hub	Linksys	5 Port 10/100	R91304 7001587 EB1040
Remote Mote	Dust Networks	Mote	1A D2

Test Conditions / Notes:

15.247 (d)/15.209
This wireless mesh network has components to gather transducer signals that are coming from sensors that are mounted on industrial equipments and returns their respective signals back to a host computer to be used for maintenance and servicing of that equipment. The components include a Gateway Manager module, a number of MOTEs and Repeaters, the sensing transducer and wiring. The Gateway Manager module services as the data collection point as well as connection into the wireless mesh and relays the data over to a host computer system. Additionally, the Gateway Manager handles the management of the network communication link between the MOTEs and Repeater, and determines the path that the data takes through the network back to the Gateway Manager.

The Gateway Manager (part number 185510-01) is the main interface component that connects the wireless nodes (via MOTES and Repeaters) of the mesh network over to the computer system. The Gateway Manager can be

operated as a single unit or in redundancy mod configuration. In the second mode, which is the mode under test, two units are used and both are connected to the computer via each module's Ethernet ports and to one another via a serial port. The primary unit is in operational mode and second unit in stand-by mode. If the primary unit fails, then the secondary unit takes over the network responsibilities.

Ports:
Power input port is normally connected to external 24-volt DC supply power.
Ethernet Cat-5 is used between the Network hub or Computer and the Gateway Manager module.

Serial-1: RS-232 is only used in the Redundancy configuration and connects between the two Gateway Manager modules.

Serial-2: Normally is not connected to or used. This is a RS-232 link and this maintenance port is used by a GE service person and would be connected between the service computer and Gateway Manager module Unterminated serial cables are connected to the Serial-2 Ports.

Antenna interface uses a reverse style SMA connector on the Gateway Manager antenna connector interface port. There are two antenna configurations that can be connected to the Gateway Manager module. One is via a 2 dBi short antenna (rubber ducky) that is directly connected at the rear of the module and the second configuration uses a 75 feet antenna cable -4 dB with a 6 dBi antenna so that the wireless link can be mounted remotely. An in-line surge suppressor is mounted between the cable and the Gateway Manager module's antenna port. A 2 dBi antenna is connected to one of the EUT and the 6 dBi antenna is connected to the second EUT.

The 802.15.4 transceivers in each of the EUTs are in the receive mode.

Rack Unit

Frequencies investigated were from 1-25 GHz

The temperature was 22.3°C and the humidity was 35%.
RBW = 1 MHz VBW = 3 MHz

Transducer Legend:

T1=Cable 20m andrews	T2=Cable P05346 20m andrews
T3=Cable HF P01527	T4=Amp AN02114 to 26.5GHz
T5=ANT AN00327 900MHz-18.5GHz	T6=Filter 3GHz HP AN01440

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T6	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB dB dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	4959.961M	30.9	+9.7 +33.5	+9.3 +0.6	+0.6	-33.9	+0.0	50.7	54.0 Remote HI	-3.3	Vert
2	7440.000M	33.0	+0.0 +36.7	+12.0 +3.1	+0.9	-35.1	+0.0	50.6	54.0 Standard HI	-3.4	Vert
3	7334.973M	34.6	+0.0 +36.2	+12.0 +1.2	+0.9	-35.3	+0.0	49.6	54.0 Remote Mid	-4.4	Vert
4	4809.983M Ave	30.8	+9.0 +33.2	+9.1 +0.5	+0.7	-34.1	+0.0	49.2	54.0 Remote Lo	-4.8	Vert
^	4809.983M	38.2	+8.9 +33.2	+9.1 +0.5	+0.7	-34.1	+0.0	56.5	54.0 Remote Lo	+2.5	Vert
^	4809.977M	32.4	+9.0 +33.2	+9.1 +0.5	+0.7	-34.1	+0.0	50.8	54.0 Standard Lo	-3.2	Vert

7	4959.964M	29.1	+9.7	+9.3	+0.6	-33.9	+0.0	48.9	54.0	-5.1	Vert
			+33.5	+0.6					Standard HI		
8	4890.133M	28.6	+9.4	+9.2	+0.7	-34.0	+0.0	47.8	54.0	-6.2	Vert
	Ave		+33.4	+0.5					Remote Mid		
^	4890.133M	38.0	+9.4	+9.2	+0.7	-34.0	+0.0	57.2	54.0	+3.2	Vert
			+33.4	+0.5					Remote Mid		
^	4890.130M	31.4	+9.4	+9.2	+0.7	-34.0	+0.0	50.6	54.0	-3.4	Vert
			+33.4	+0.5					Standard Mid		
11	7440.000M	29.1	+0.0	+12.0	+0.9	-35.1	+0.0	46.7	54.0	-7.3	Vert
			+36.7	+3.1					Remote HI		
12	7334.978M	28.4	+0.0	+12.0	+0.9	-35.2	+0.0	44.8	54.0	-9.2	Vert
			+36.5	+2.2					Standard Mid		
13	7214.961M	27.6	+0.0	+12.0	+0.9	-35.3	+0.0	42.6	54.0	-11.4	Vert
	Ave		+36.2	+1.2					Remote Lo		
^	7214.977M	40.1	+0.0	+12.0	+0.9	-35.3	+0.0	55.1	54.0	+1.1	Vert
			+36.2	+1.2					Remote Lo		
^	7214.977M	30.0	+0.0	+12.0	+0.9	-35.3	+0.0	45.0	54.0	-9.0	Vert
			+36.2	+1.2					Standard Lo		

Test Location: CKC Laboratories •5046 Sierra Pines Dr. • Mariposa, CA 95338 • 209 966-5240

Customer:	**Bently Nevada LLC.**		
Specification:	**FCC 15.209/15.247(d)**		
Work Order #:	**88570**	Date:	2/11/2009
Test Type:	**Maximized Emissions**	Time:	1:28:04 PM
Equipment:	**Essential Insight.mesh Gateway Manager**	Sequence#:	26
Manufacturer:	Bently Nevada LLC.	Tested By:	Chuck Kendall
Model:	185511-01/179168-01		
S/N:	0-17-0D-00-00-30-B6		

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A	US443000407	08/07/2008	08/07/2010	02660
EMCO Loop Antenna	1074	05/01/2007	05/01/2009	00226
10m site A cable	N.A	05/11/2007	05/11/2009	MA10m

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Essential Insight.mesh Gateway Manager*	Bently Nevada LLC.	185511-01/179168-01	0-17-0D-00-00-30-B6
Essential Insight.mesh Gateway Manager	Bently Nevada LLC.	185511-01/179168-01	0-17-0D-00-00-2E-D9
DC Power Supply	Traco	TSP090-224-BM	20813126047
DC Power Supply	Traco	TSP090-224-BM	20813126391

Support Devices:

Function	Manufacturer	Model #	S/N
Remote Computer	Dell	DCNE	4FN1YC1
Remote Monitor	Dell	170817	CN-0K0789-732-AAQ
Remote Ethernet Hub	Linksys	5 Port 10/100	R91304 7001587 EB1040
Remote Mote	Dust Networks	Mote	1A D2
Omni-Directional Antenna with 75’ of Coax	HyperLink	HGGB2406U	NA
Small Omni-Directional Antenna	Laird/Aerocomm	0600-00014	NA

Test Conditions / Notes:

FCC 15.209/15.247(d) Magnetic

This wireless mesh network has components to gather transducer signals that are coming from sensors that are mounted on industrial equipments and returns their respective signals back to a host computer to be used for maintenance and servicing of that equipment. The components include a Gateway Manager module, a number of MOTEs and Repeaters, the sensing transducers and wiring. The Gateway Manager module service as the data collection point as well as connection into the wireless mesh and relays the data over to a host computer system. Additionally, the Gateway Manager handles the management of the network communication link between the MOTEs and Repeater, and determines the path that the data takes through the network back to the Gateway Manager.

The stand-alone Gateway Manager module is built from two base parts (part number 185511-01 with the interface base 179168-01) is the main interface component that connects the wireless nodes (via MOTES and Repeaters) of the mesh network over to the computer system. The Gateway Manager can be operated as a single unit or in redundancy mode configuration. In the second mode two units are used and both are connected to the computer via each module’s Ethernet ports and to one another via a serial port. The primary unit is in operational mode and second unit in stand-by. If the primary unit fails, then the secondary unit takes over the network responsibilities.

Ports:
Power input port is normally connected to external 24-volt DC supply power.

Ethernet Cat-5 is used between the Network hub or Computer and the Gateway Manager module.

Serial-1: RS-232 is only used in the Redundancy configuration and connects between the two Gateway Manager modules.

Some of the ports on the module are not normally used or are not connected to the Gateway Manager. These ports would normally have covers over them when they are installed at the customer site.

Serial-2: Normally is not connected to or used. This is a RS-232 link and this maintenance port is used by a GE service person and would be connected between the service computer and Gateway Manager module.

The stand-alone interface base is used for other modules and so some of the ports that are built into the base are neither used or are connected to the Gateway Manager module. The multi-pin for base-to-base connector interface is not connected to the Gateway Manager. Additionally, the top Ethernet port of the dual Ethernet port on the rear of the module is not connected to the Gateway Manager. These ports have been covered and are documented in the respective manuals.

Antenna interface uses a reverse style SMA connector on the Gateway Manager antenna connector interface port. There are two antenna configurations that can be connected to the Gateway Manager module. One is via a 2 dB small antenna (rubber ducky) that is directly connected at the rear of the module and the second configuration uses a 75 feet antenna cable -4 dB with a 6 dB antenna so that the wireless link can be mounted remotely. An in-line surge suppressor is mounted between the cable and the Gateway Manager module's antenna port.

Stand Alone Units

Frequencies investigated were from 9 kHz to 30 MHz

The temperature was 22.3°C and the humidity was 35%.

RBW = 9 kHz VBW = 30 kHz

Transducer Legend:

T1=MA10M	T2=Mag Loop - AN 00226 - 9kHz-30M

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	789.755k	58.0	+0.3	+10.0			-20.0	48.3	29.6	+18.7	Vert
	Ambient								AM Radio Station		
2	1.059M	54.9	+0.3	+10.1			-20.0	45.3	27.1	+18.2	Vert
	Ambient								AM Radio Station		
3	29.679M	55.8	+2.1	+5.8			-20.0	43.7	29.5	+14.2	Vert
	Ambient								CB radio		
4	1.599M	44.7	+0.4	+10.0			-20.0	35.1	23.5	+11.6	Vert
	Ambient								AM Radio Station		
5	940.285k	47.2	+0.3	+10.1			-20.0	37.6	28.1	+9.5	Vert
	Ambient								AM Radio Station		
6	1.659M	41.9	+0.4	+10.0			-20.0	32.3	23.1	+9.2	Vert
	Ambient								AM Radio Station		

7	837.841k	47.3	+0.3	+10.0	-20.0	37.6	29.1	+8.5	Vert	
	Ambient						AM Radio Station			
8	1.430M	41.8	+0.4	+10.0	-20.0	32.2	24.4	+7.8	Vert	
	Ambient						AM Radio Station			
9	578.594k	49.5	+0.2	+10.0	-20.0	39.7	32.3	+7.4	Vert	
	Ambient						AM Radio Station			
10	1.300M	41.8	+0.3	+10.1	-20.0	32.2	25.3	+6.9	Vert	
	Ambient						AM Radio Station			
11	1.680M	39.2	+0.4	+10.0	-20.0	29.6	23.0	+6.6	Vert	
	Ambient						AM Radio Station			
12	11.781M	44.9	+1.3	+9.7	-20.0	35.9	29.5	+6.4	Vert	
	Ambient						Short Wave Radio Station			
13	1.551M	38.3	+0.4	+10.0	-20.0	28.7	23.7	+5.0	Vert	
	Ambient						AM Radio Station			
14	1.131M	41.0	+0.3	+10.1	-20.0	31.4	26.5	+4.9	Vert	
	Ambient						AM Radio Station			
15	9.997M	42.5	+1.2	+9.8	-20.0	33.5	29.5	+4.0	Vert	
	Ambient						WWV signal			
16	1.248M	39.1	+0.3	+10.1	-20.0	29.5	25.6	+3.9	Vert	
	Ambient						AM Radio Station			
17	900.562k	41.7	+0.3	+10.1	-20.0	32.1	28.5	+3.6	Vert	
	Ambient						AM Radio Station			
18	1.480M	37.3	+0.4	+10.0	-20.0	27.7	24.1	+3.6	Vert	
	Ambient						AM Radio Station			
19	1.511M	36.6	+0.4	+10.0	-20.0	27.0	24.0	+3.0	Vert	
	Ambient						AM Radio Station			
20	1.329M	37.1	+0.4	+10.0	-20.0	27.5	25.1	+2.4	Vert	
	Ambient						AM Radio Station			
21	1.009M	39.4	+0.3	+10.1	-20.0	29.8	27.5	+2.3	Vert	
	Ambient						AM Radio Station			
22	977.918k	39.3	+0.3	+10.1	-20.0	29.7	27.8	+1.9	Vert	
	Ambient						AM Radio Station			
23	739.578k	40.9	+0.3	+10.0	-20.0	31.2	30.2	+1.0	Vert	
	Ambient						AM Radio Station			
24	1.179M	36.7	+0.3	+10.1	-20.0	27.1	26.1	+1.0	Vert	
	Ambient						AM Radio Station			
25	620.408k	41.8	+0.2	+10.0	-20.0	32.0	31.7	+0.3	Vert	
	Ambient						AM Radio Station			
26	1.361M	33.9	+0.4	+10.0	-20.0	24.3	24.9	-0.6	Vert	
	Ambient						AM Radio Station			
27	1.580M	31.5	+0.4	+10.0	-20.0	21.9	23.6	-1.7	Vert	
	Ambient						AM Radio Station			
28	1.530M	31.5	+0.4	+10.0	-20.0	21.9	23.8	-1.9	Vert	
	Ambient						AM Radio Station			
29	1.210M	32.7	+0.3	+10.1	-20.0	23.1	25.9	-2.8	Vert	
	Ambient						AM Radio Station			
30	549.324k	39.2	+0.2	+10.0	-20.0	29.4	32.8	-3.4	Vert	
	Ambient									

Test Location: CKC Laboratories •5046 Sierra Pines Dr. • Mariposa, CA 95338 • 209 966-5240

Customer:	**Bently Nevada LLC.**		
Specification:	**FCC 15.209/15.247(d)**		
Work Order #:	**88570**	Date:	2/4/2009
Test Type:	**Maximized Emissions**	Time:	12:34:19
Equipment:	**Essential Insight.mesh Gateway Manager**	Sequence#:	2
Manufacturer:	Bently Nevada LLC.	Tested By:	Chuck Kendall
Model:	185511-01/179168-01		
S/N:	0-17-0D-00-00-30-B6 & 0-17-0D-00-00-2E-D9		

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP8593EM	3624A00159	03/23/2007	03/23/2009	02111
Bilog Antenna	2455	04/27/2007	04/27/2009	01992
HP-8447D Preamp	2727A05444	06/20/2008	06/20/2010	00062
Site A 10 meter cable set		05/11/2007	05/11/2009	MA10M

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Essential Insight.mesh Gateway Manager*	Bently Nevada LLC.	185511-01/179168-01	0-17-0D-00-00-30-B6
Essential Insight.mesh Gateway Manager	Bently Nevada LLC.	185511-01/179168-01	0-17-0D-00-00-2E-D9
DC Power Supply	Traco	TSP090-224-BM	20813126047
DC Power Supply	Traco	TSP090-224-BM	20813126391

Support Devices:

Function	Manufacturer	Model #	S/N
Remote Computer	Dell	DCNE	4FN1YC1
Remote Monitor	Dell	170817	CN-0K0789-732-AAQ
Remote Ethernet Hub	Linksys	5 Port 10/100	R91304 7001587 EB1040
Remote Mote	Dust Networks	Mote	1A D2
Omni-Directional Antenna with 75' of Coax	HyperLink	HGGB2406U	NA
Small Omni-Directional Antenna	Laird/Aerocomm	0600-00014	NA

Test Conditions / Notes:

FCC 15.209/15.247(d)
This wireless mesh network has components to gather transducer signals that are coming from sensors that are mounted on industrial equipments and returns their respective signals back to a host computer to be used for maintenance and servicing of that equipment. The components include a Gateway Manager module, a number of MOTEs and Repeaters, the sensing transducers and wiring. The Gateway Manager module service as the data collection point as well as connection into the wireless mesh and relays the data over to a host computer system. Additionally, the Gateway Manager handles the management of the network communication link between the MOTEs and Repeater, and determines the path that the data takes through the network back to the Gateway Manager.

The stand-alone Gateway Manager module is built from two base parts (part number 185511-01 with the interface base 179168-01) is the main interface component that connects the wireless nodes (via MOTES and Repeaters) of the mesh network over to the computer system. The Gateway Manager can be operated as a single unit or in

redundancy mode configuration. In the second mode two units are used and both are connected to the computer via each module's Ethernet ports and to one another via a serial port. The primary unit is in operational mode and second unit in stand-by. If the primary unit fails, then the secondary unit takes over the network responsibilities.

Ports:
Power input port is normally connected to external 24-volt DC supply power.

Ethernet Cat-5 is used between the Network hub or Computer and the Gateway Manager module.

Serial-1: RS-232 is only used in the Redundancy configuration and connects between the two Gateway Manager modules.

Some of the ports on the module are not normally used or are not connected to the Gateway Manager. These ports would normally have covers over them when they are installed at the customer site.

Serial-2: Normally is not connected to or used. This is a RS-232 link and this maintenance port is used by a GE service person and would be connected between the service computer and Gateway Manager module.

The stand-alone interface base is used for other modules and so some of the ports that are built into the base are neither used or are connected to the Gateway Manager module. The multi-pin for base-to-base connector interface is not connected to the Gateway Manager. Additionally, the top Ethernet port of the dual Ethernet port on the rear of the module is not connected to the Gateway Manager. These ports have been covered and are documented in the respective manuals.

Antenna interface uses a reverse style SMA connector on the Gateway Manager antenna connector interface port. There are two antenna configurations that can be connected to the Gateway Manager module. One is via a 2 dB small antenna (rubber ducky) that is directly connected at the rear of the module and the second configuration uses a 75 feet antenna cable -4 dB with a 6 dB antenna so that the wireless link can be mounted remotely. An in-line surge suppressor is mounted between the cable and the Gateway Manager module's antenna port.

Ground strap added to both units.

Frequencies investigated were from 30 MHz to 1000 MHz

The frequency range investigated was 30-1000 MHz.
The temperature was 21.9°C and the humidity was 45%.
RBW = 120 kHz VBW = 300 kHz

Transducer Legend:

T1=AMP-AN00062-062008	T2=ANT AN01992 25-1000MHz
T3=MA10M	

Measurement Data: Reading listed by margin. Test Distance: 10 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	250.006M	40.9	-29.8	+12.7	+3.7		+10.0	37.5	46.0	-8.5	Vert
2	49.998M	40.0	-30.7	+9.1	+2.2		+10.0	30.6	40.0	-9.4	Vert
3	400.930M	33.0	-30.3	+16.5	+5.2		+10.0	34.4	46.0	-11.6	Horiz
4	343.683M	34.0	-29.8	+15.0	+4.7		+10.0	33.9	46.0	-12.1	Horiz
5	51.098M	37.4	-30.7	+8.9	+2.2		+10.0	27.8	40.0	-12.2	Vert

6	350.002M	33.0	-29.8	+15.2	+4.7	+10.0	33.1	46.0	-12.9	Vert
7	149.983M	36.1	-30.4	+11.8	+2.8	+10.0	30.3	43.5	-13.2	Vert
8	372.297M	31.9	-30.0	+15.8	+5.0	+10.0	32.7	46.0	-13.3	Horiz
9	343.660M	32.7	-29.8	+15.0	+4.7	+10.0	32.6	46.0	-13.4	Vert
10	286.397M	34.3	-29.7	+13.4	+4.1	+10.0	32.1	46.0	-13.9	Horiz
11	300.001M	33.9	-29.7	+13.7	+4.2	+10.0	32.1	46.0	-13.9	Vert
12	265.560M	34.9	-29.7	+13.0	+3.9	+10.0	32.1	46.0	-13.9	Horiz
13	149.981M	35.2	-30.4	+11.8	+2.8	+10.0	29.4	43.5	-14.1	Horiz
14	300.005M	33.6	-29.7	+13.7	+4.2	+10.0	31.8	46.0	-14.2	Vert
15	286.370M	33.6	-29.7	+13.4	+4.1	+10.0	31.4	46.0	-14.6	Horiz
16	250.358M	34.0	-29.8	+12.7	+3.7	+10.0	30.6	46.0	-15.4	Horiz
17	299.536M	31.9	-29.7	+13.7	+4.2	+10.0	30.1	46.0	-15.9	Horiz
18	269.950M	32.6	-29.7	+13.1	+3.9	+10.0	29.9	46.0	-16.1	Horiz
19	224.981M	34.2	-29.8	+10.9	+3.5	+10.0	28.8	46.0	-17.2	Vert
20	349.901M	27.4	-29.8	+15.2	+4.7	+10.0	27.5	46.0	-18.5	Horiz
21	224.973M	30.9	-29.8	+10.9	+3.5	+10.0	25.5	46.0	-20.5	Horiz

Test Location: CKC Laboratories •5046 Sierra Pines Dr. • Mariposa, CA 95338 • 209 966-5240

Customer:	**Bently Nevada LLC.**		
Specification:	**FCC 15.209/15.247(d)**		
Work Order #:	**88570**	Date:	2/19/2009
Test Type:	**Maximized Emissions**	Time:	13:01:28
Equipment:	**Essential Insight.mesh Gateway Manager**	Sequence#:	23
Manufacturer:	Bently Nevada LLC.	Tested By:	Chuck Kendall
Model:	185511-01/179168-01		
S/N:	0-17-0D-00-00-30-B6		

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A	US443000407	08/07/2008	08/07/2010	02660
40dB pre amp	9002	03/20/2007	03/20/2009	AN02114
Cable, WL Gore 2'	149047	05/09/2007	05/09/2009	P01527
EMCO 3115 Horn Antenna	9006-3413	06/06/2008	06/06/2010	327
Cable, Andrews Hardline HF-005-20	NA	09/04/2007	09/04/2009	P05346
3 GHz HP Filter	N/A	05/14/2007	05/14/2009	AN01440

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Essential Insight.mesh Gateway Manager*	Bently Nevada LLC.	185511-01/179168-01	0-17-0D-00-00-30-B6
Essential Insight.mesh Gateway Manager	Bently Nevada LLC.	185511-01/179168-01	0-17-0D-00-00-2E-D9
DC Power Supply	Traco	TSP090-224-BM	20813126047
DC Power Supply	Traco	TSP090-224-BM	20813126391

Support Devices:

Function	Manufacturer	Model #	S/N
Remote Computer	Dell	DCNE	4FN1YC1
Remote Monitor	Dell	170817	CN-0K0789-732-AAQ
Remote Ethernet Hub	Linksys	5 Port 10/100	R91304 7001587 EB1040
Remote Mote	Dust Networks	Mote	1A D2
Omni-Directional Antenna with 75' of Coax	HyperLink	HGGB2406U	NA
Small Omni-Directional Antenna	Laird/Aerocomm	0600-00014	NA

Test Conditions / Notes:

FCC 15.209/15.247(d) Radiated Spurious Emissions

This wireless mesh network has components to gather transducer signals that are coming from sensors that are mounted on industrial equipments and returns their respective signals back to a host computer to be used for maintenance and servicing of that equipment. The components include a Gateway Manager module, a number of MOTEs and Repeaters, the sensing transducers and wiring. The Gateway Manager module service as the data collection point as well as connection into the wireless mesh and relays the data over to a host computer system. Additionally, the Gateway Manager handles the management of the network communication link between the MOTEs and Repeater, and determines the path that the data takes through the network back to the Gateway Manager.

The stand-alone Gateway Manager module is built from two base parts (part number 185511-01 with the interface base 179168-01) is the main interface component that connects the wireless nodes (via MOTES and Repeaters) of the mesh network over to the computer system. The Gateway Manager can be operated as a single unit or in redundancy mode configuration. In the second mode two units are used and both are connected to the computer via each module's Ethernet ports and to one another via a serial port. The primary unit is in operational mode and second unit in stand-by. If the primary unit fails, then the secondary unit takes over the network responsibilities.

Ports:
Power input port is normally connected to external 24-volt DC supply power.

Ethernet Cat-5 is used between the Network hub or Computer and the Gateway Manager module.

Serial-1: RS-232 is only used in the Redundancy configuration and connects between the two Gateway Manager modules.

Some of the ports on the module are not normally used or are not connected to the Gateway Manager. These ports would normally have covers over them when they are installed at the customer site.

Serial-2: Normally is not connected to or used. This is a RS-232 link and this maintenance port is used by a GE service person and would be connected between the service computer and Gateway Manager module.

The stand-alone interface base is used for other modules and so some of the ports that are built into the base are neither used or are connected to the Gateway Manager module. The multi-pin for base-to-base connector interface is not connected to the Gateway Manager. Additionally, the top Ethernet port of the dual Ethernet port on the rear of the module is not connected to the Gateway Manager. These ports have been covered and are documented in the respective manuals.

Antenna interface uses a reverse style SMA connector on the Gateway Manager antenna connector interface port. There are two antenna configurations that can be connected to the Gateway Manager module. One is via a 2 dB small antenna (rubber ducky) that is directly connected at the rear of the module and the second configuration uses a 75 feet antenna cable -4 dB with a 6 dB antenna so that the wireless link can be mounted remotely. An in-line surge suppressor is mounted between the cable and the Gateway Manager module's antenna port.

Stand Alone Unit

Frequencies investigated were from 1-25 GHz
The temperature was 22.3°C and the humidity was 35%.

RBW = 1 MHz VBW = 1 MHz

Transducer Legend:

T1=Cable 20m andrews	T2=Cable P05346 20m andrews
T3=Cable HF P01527	T4=Amp AN02114 to 26.5GHz
T5=ANT AN00327 900MHz-18.5GHz	T6=Filter 3GHz HP AN01440

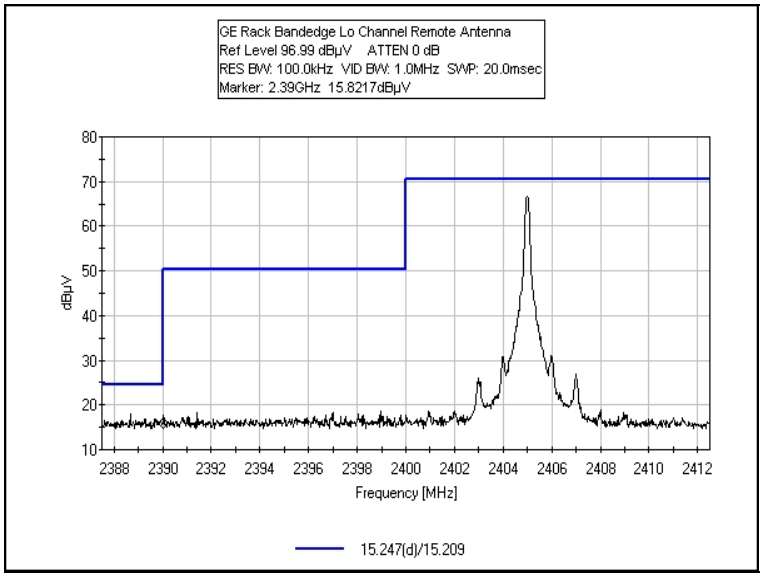
Measurement Data: Reading listed by margin. Test Distance: 1 Meter

#	Freq	Rdng	T1 T5	T2 T6	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	4809.775M	45.5	+8.9 +33.2	+9.1 +0.5	+0.7	-34.1	-10.0	53.8	54.0 Standard Antenna Transmitting on Lo Channel	-0.2	Vert

2	4890.000M	32.7	+9.4 +33.4	+9.2 +0.5	+0.7	-34.0	+0.0	51.9	54.0	-2.1	Vert Standard Antenna Transmitting on Mid Channel
3	4809.990M Ave	43.1	+9.0 +33.2	+9.1 +0.5	+0.7	-34.1	-10.0	51.5	54.0	-2.5	Vert Standard Antenna Transmitting on Lo Channel
4	7440.325M	40.8	+0.0 +36.7	+12.0 +3.1	+0.9	-35.1	-10.0	48.4	54.0	-5.6	Vert Remote Antenna Transmitting on Hi Channel
5	4959.964M Ave	28.6	+9.7 +33.5	+9.3 +0.6	+0.6	-33.9	+0.0	48.4	54.0	-5.6	Vert Standard Antenna Transmitting on High Channel
6	4959.700M	36.0	+9.7 +33.5	+9.3 +0.6	+0.6	-33.9	-10.0	45.8	54.0	-8.2	Vert Remote Antenna Transmitting on Hi Channel
7	7334.825M	39.3	+0.0 +36.5	+12.0 +2.2	+0.9	-35.2	-10.0	45.7	54.0	-8.3	Vert Remote Antenna Transmitting on Mid Channel
8	7439.974M	27.4	+0.0 +36.7	+12.0 +3.1	+0.9	-35.1	+0.0	45.0	54.0	-9.0	Vert Standard Antenna Transmitting on High Channel
9	7335.000M	27.7	+0.0 +36.5	+12.0 +2.2	+0.9	-35.2	+0.0	44.1	54.0	-9.9	Vert Standard Antenna Transmitting on Mid Channel
10	7214.775M	38.9	+0.0 +36.2	+12.0 +1.2	+0.9	-35.3	-10.0	43.9	54.0	-10.1	Vert Remote Antenna Transmitting on Lo Channel
11	4809.775M	35.2	+8.9 +33.2	+9.1 +0.5	+0.7	-34.1	-10.0	43.5	54.0	-10.5	Vert Remote Antenna Transmitting on Lo Channel
12	4889.775M	33.7	+9.3 +33.4	+9.2 +0.5	+0.7	-34.0	-10.0	42.8	54.0	-11.2	Vert Remote Antenna Transmitting on Mid Channel

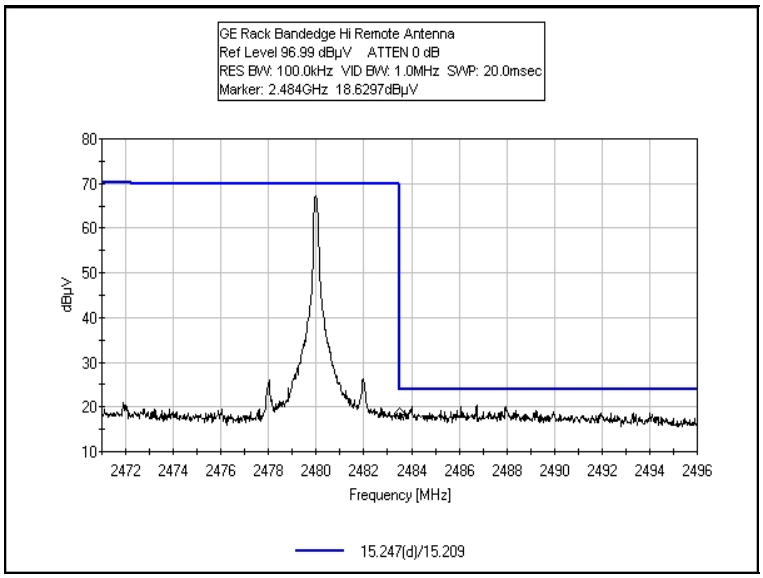
Test Plots

BANDEDGE RACK LOW CHANNEL REMOTE ANTENNA

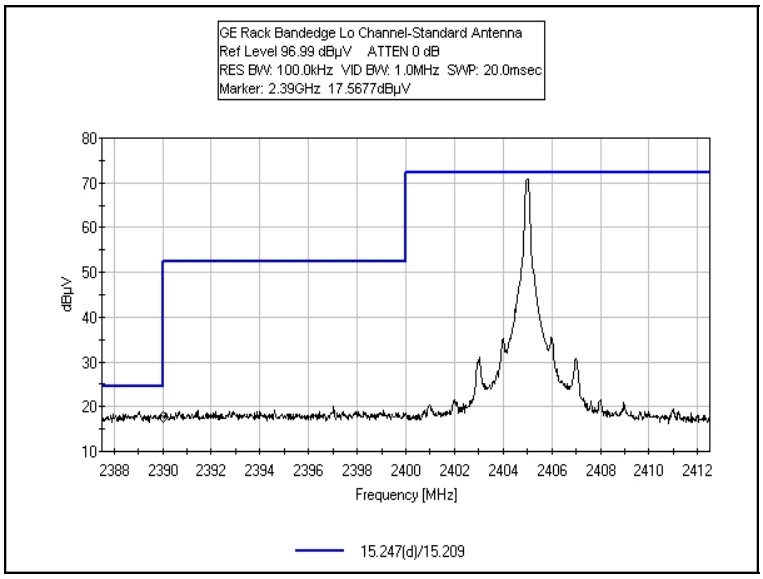


Note: The limit line reported on the bandedge plots includes the correction factor to 1 MHz bandwidth as required by DA00-705 marker delta method. The correction factor used was 3.8 dB. Outside of the 2 MHz away from the bandedge, no EUT signals were observed. Refer to spurious emissions data sheet for other emissions.

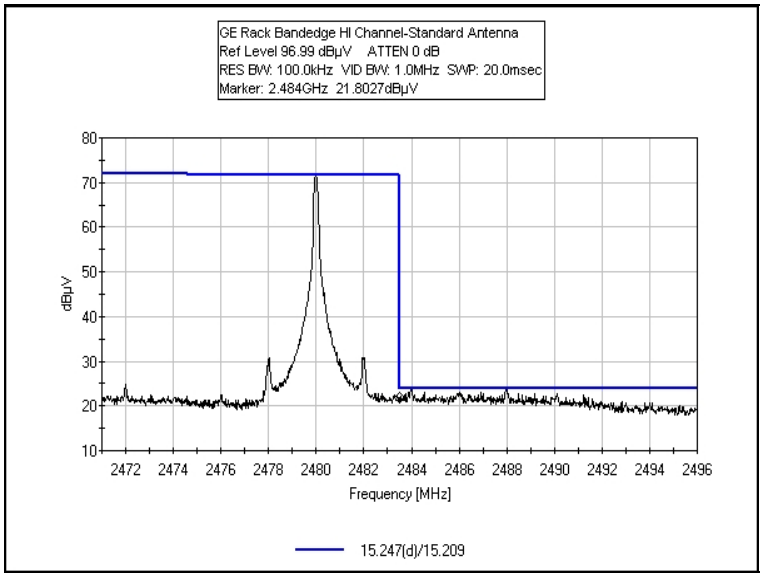
BANDEDGE RACK HIGH CHANNEL REMOTE ANTENNA



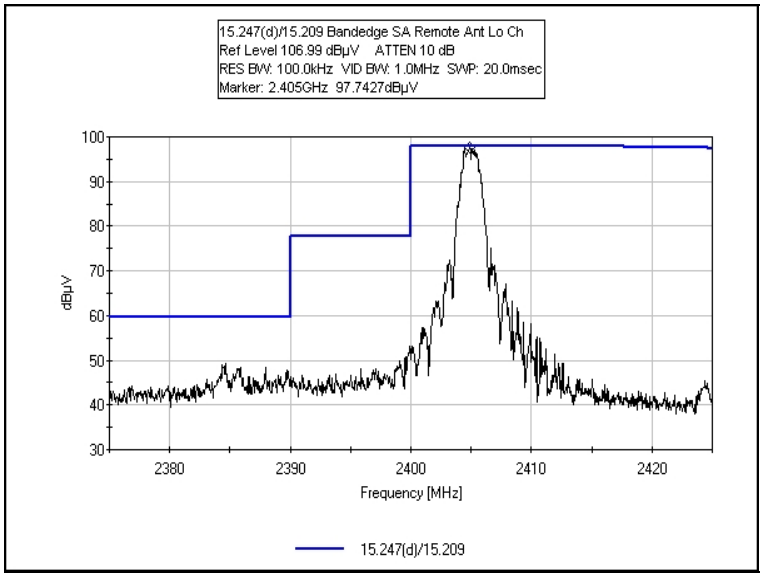
BANDEDGE RACK LOW CHANNEL STANDARD ANTENNA



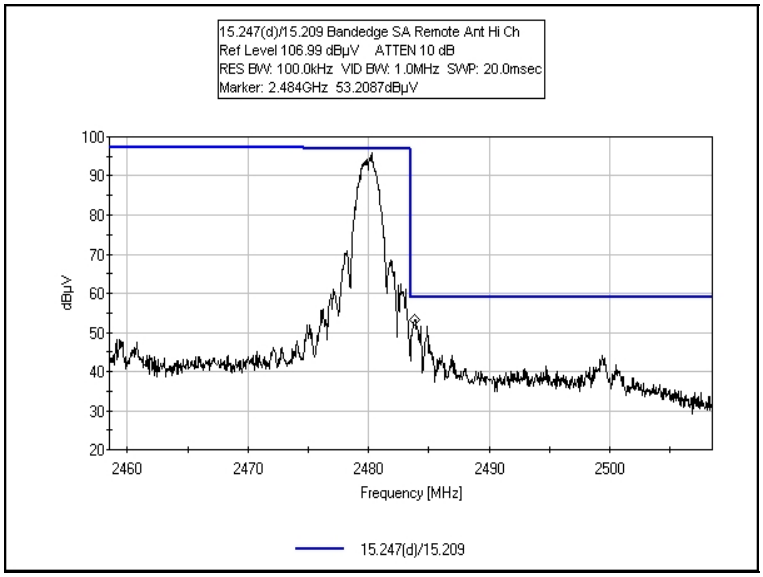
BANDEDGE RACK HIGH CHANNEL STANDARD ANTENNA



BANDEDGE STAND ALONE LOW CHANNEL REMOTE ANTENNA



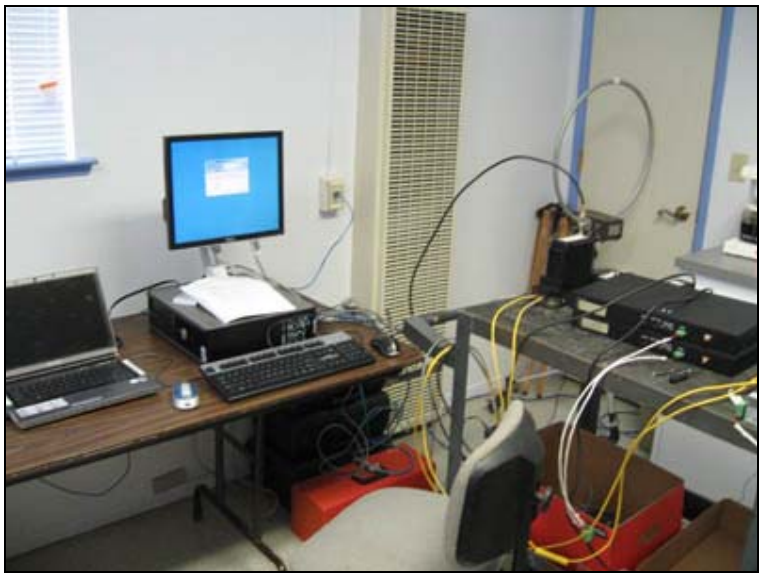
FCC 15.247(d) BANDEDGE STAND ALONE HIGH CHANNEL REMOTE ANTENNA



FCC 15.247(e) – PEAK POWER SPECTRAL DENSITY

Test Setup Photos

Rack



Stand Alone

Test Data Sheets

Test Location: CKC Laboratories •5046 Sierra Pines Dr. • Mariposa, CA 95338 • 209 966-5240

Customer:	**Bently Nevada LLC.**		
Specification:	**15.247(e)**		
Work Order #:	**88570**	Date:	2/18/2009
Test Type:	**Maximized Emissions**	Time:	16:33:29
Equipment:	**Essential Insight.mesh Gateway Manager**	Sequence#:	61
Manufacturer:	Bently Nevada LLC.	Tested By:	Chuck Kendall
Model:	185510-01		
S/N:	0-17-0D-00-00-30-C4		

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A	US443000407	08/07/2008	08/07/2010	02660
Cable, Andrews Hardline HF-005-20	NA	09/28/2007	09/28/2009	P04276

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Essential Insight.mesh Gateway Manager*	Bently Nevada LLC.	185510-01	0-17-0D-00-00-30-C4
Essential Insight.mesh Gateway Manager	Bently Nevada LLC.	185510-01	0-17-0D-00-00-2D-99
DC Power Supply	Traco	TSP090-224-BM	20813126047
DC Power Supply	Traco	TSP090-224-BM	20813126047

Support Devices:

Function	Manufacturer	Model #	S/N
Remote Computer	Dell	DCNE	4FN1YC1
Remote Monitor	Dell	170817	CN-0K0789-732-AAQ
Remote Ethernet Hub	Linksys	5 Port 10/100	R91304 7001587 EB1040
Remote Mote	Dust Networks	Mote	1A D2

Test Conditions / Notes:

FCC 15.247(e) Power Spectral Density - Operating

EUT is 802.15.4 transmitter and is operating on the Low, Mid, and High channels as noted in the datasheet readings. The transmitter is transmitting continuously with modulation - Channel 0 Low = 2405 MHz, Channel 8 Mid = 2445 MHz, and Channel 15 High = 2480 MHz. The temperature was 22.3°C and the humidity was 35%. Frequency range investigated was 2.400 GHz to 2.4835 GHz.

This wireless mesh network has components to gather transducer signals that are coming from sensors that are mounted on industrial equipments and returns their respective signals back to a host computer to be used for maintenance and servicing of that equipment. The components include a Gateway Manager module, a number of MOTEs and Repeaters, the sensing transducer and wiring. The Gateway Manager module services as the data collection point as well as connection into the wireless mesh and relays the data over to a host computer system. Additionally, the Gateway Manager handles the management of the network communication link between the MOTEs and Repeater, and determines the path that the data takes through the network back to the Gateway Manager.

The Gateway Manager (part number 185510-01) is the main interface component that connects the wireless nodes (via MOTES and Repeaters) of the mesh network over to the computer system. The Gateway Manager can be

operated as a single unit or in redundancy mod configuration. In the second mode, which is the mode under test, two units are used and both are connected to the computer via each module's Ethernet ports and to one another via a serial port. The primary unit is in operational mode and second unit in stand-by mode. If the primary unit fails, then the secondary unit takes over the network responsibilities.

Ports:
Power input port is normally connected to external 24-volt DC supply power.
Ethernet Cat-5 is used between the Network hub or Computer and the Gateway Manager module.

Serial-1: RS-232 is only used in the Redundancy configuration and connects between the two Gateway Manager modules.

Serial-2: Normally is not connected to or used. This is a RS-232 link and this maintenance port is used by a GE service person and would be connected between the service computer and Gateway Manager module Unterminated serial cables are connected to the Serial-2 Ports.

Antenna interface uses a reverse style SMA connector on the Gateway Manager antenna connector interface port. There are two antenna configurations that can be connected to the Gateway Manager module. One is via a 2 dBi short antenna (rubber ducky) that is directly connected at the rear of the module and the second configuration uses a 75 feet antenna cable -4 dB with a 6 dBi antenna so that the wireless link can be mounted remotely. An in-line surge suppressor is mounted between the cable and the Gateway Manager module's antenna port. A 2 dBi antenna is connected to one of the EUT and the 6 dBi antenna is connected to the second EUT.

Rack Units

RBW = 3 kHz VBW 30 kHz

Transducer Legend:

T1=Cable ANP04276 25'

Measurement Data: Reading listed by margin. Test Distance: None

#	Freq MHz	Rdng dBµV	T1 dB	dB	dB	dB	Dist Table	Corr dBm	Spec dBm	Margin dB	Polar Ant
1	2405.198M	-8.5	+2.3				+0.0	-6.2	8.0	-14.2	None
									Lo Channel (0)		
2	2445.078M	-8.8	+2.3				+0.0	-6.5	8.0	-14.5	None
									Mid Channel (8)		
3	2480.072M	-9.4	+2.4				+0.0	-7.0	8.0	-15.0	None
									High Channel (15)		

Test Location: CKC Laboratories •5046 Sierra Pines Dr. • Mariposa, CA 95338 • 209 966-5240

Customer:	**Bently Nevada LLC.**		
Specification:	**15.247(e)**		
Work Order #:	**88570**	Date:	2/17/2009
Test Type:	**Maximized Emissions**	Time:	14:37:21
Equipment:	**Essential Insight.mesh Gateway Manager**	Sequence#:	43
Manufacturer:	Bently Nevada LLC.	Tested By:	Chuck Kendall
Model:	185511-01/179168-01		
S/N:	0-17-0D-00-00-30-B6		

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
E4446A	US443000407	08/07/2008	08/07/2010	02660
Cable, Andrews Hardline HF-005-20	NA	09/28/2007	09/28/2009	P04276

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Essential Insight.mesh Gateway Manager*	Bently Nevada LLC.	185511-01/179168-01	0-17-0D-00-00-30-B6
Essential Insight.mesh Gateway Manager	Bently Nevada LLC.	185511-01/179168-01	0-17-0D-00-00-2E-D9
DC Power Supply	Traco	TSP090-224-BM	20813126047
DC Power Supply	Traco	TSP090-224-BM	20813126391

Support Devices:

Function	Manufacturer	Model #	S/N
Remote Computer	Dell	DCNE	4FN1YC1
Remote Monitor	Dell	170817	CN-0K0789-732-AAQ
Remote Ethernet Hub	Linksys	5 Port 10/100	R91304 7001587 EB1040
Remote Mote	Dust Networks	Mote	1A D2

Test Conditions / Notes:

FCC Part 15.247 (e) Power Spectral Density

EUT is 802.15.4 transmitter and is operating on the Low, Mid, and High channels as noted in the datasheet readings. The transmitter is transmitting continuously with modulation - Channel 0 Low = 2405 MHz, Channel 8 Mid = 2445 MHz, and Channel 15 High = 2480 MHz. The temperature was 22.3°C and the humidity was 35%. RBW = 3kHz & VBW = 1 MHz.

This wireless mesh network has components to gather transducer signals that are coming from sensors that are mounted on industrial equipments and returns their respective signals back to a host computer to be used for maintenance and servicing of that equipment. The components include a Gateway Manager module, a number of MOTEs and Repeaters, the sensing transducers and wiring. The Gateway Manager module service as the data collection point as well as connection into the wireless mesh and relays the data over to a host computer system. Additionally, the Gateway Manager handles the management of the network communication link between the MOTEs and Repeater, and determines the path that the data takes through the network back to the Gateway Manager.

The stand-alone Gateway Manager module is built from two base parts (part number 185511-01 with the interface base 179168-01) is the main interface component that connects the wireless nodes (via MOTES and Repeaters) of the mesh network over to the computer system. The Gateway Manager can be operated as a single unit or in redundancy mode configuration. In the second mode two units are used and both are connected to the computer via

each module's Ethernet ports and to one another via a serial port. The primary unit is in operational mode and second unit in stand-by. If the primary unit fails, then the secondary unit takes over the network responsibilities.

Ports:
Power input port is normally connected to external 24-volt DC supply power.

Ethernet Cat-5 is used between the Network hub or Computer and the Gateway Manager module.

Serial-1: RS-232 is only used in the Redundancy configuration and connects between the two Gateway Manager modules.

Some of the ports on the module are not normally used or are not connected to the Gateway Manager. These ports would normally have covers over them when they are installed at the customer site.

Serial-2: Normally is not connected to or used. This is a RS-232 link and this maintenance port is used by a GE service person and would be connected between the service computer and Gateway Manager module.

The stand-alone interface base is used for other modules and so some of the ports that are built into the base are neither used or are connected to the Gateway Manager module. The multi-pin for base-to-base connector interface is not connected to the Gateway Manager. Additionally, the top Ethernet port of the dual Ethernet port on the rear of the module is not connected to the Gateway Manager. These ports have been covered and are documented in the respective manuals.

Antenna interface uses a reverse style SMA connector on the Gateway Manager antenna connector interface port. There are two antenna configurations that can be connected to the Gateway Manager module. One is via a 2 dB small antenna (rubber ducky) that is directly connected at the rear of the module and the second configuration uses a 75 feet antenna cable -4 dB with a 6 dB antenna so that the wireless link can be mounted remotely. An in-line surge suppressor is mounted between the cable and the Gateway Manager module's antenna port.

Stand Alone Unit
Frequencies investigated were from 2.4 GHz to 2.4835 GHz
Actual spans were 3 MHz and the sweep times used were 1000 seconds.

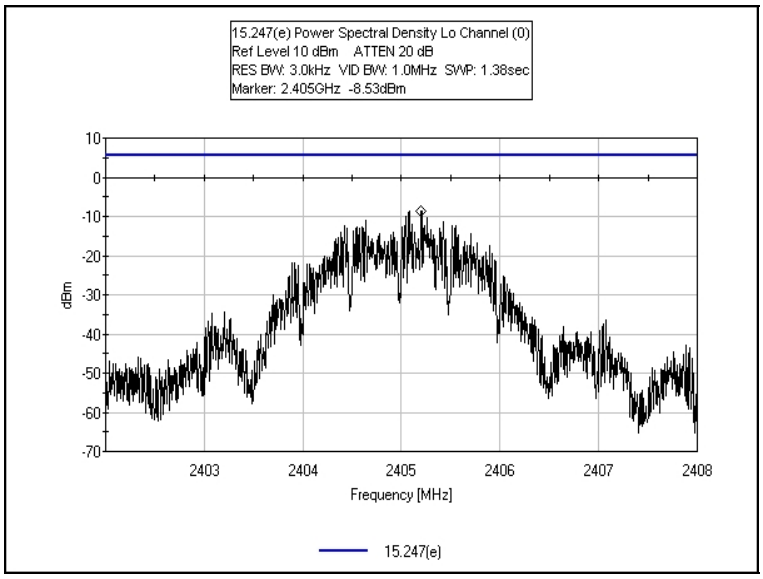
Transducer Legend:

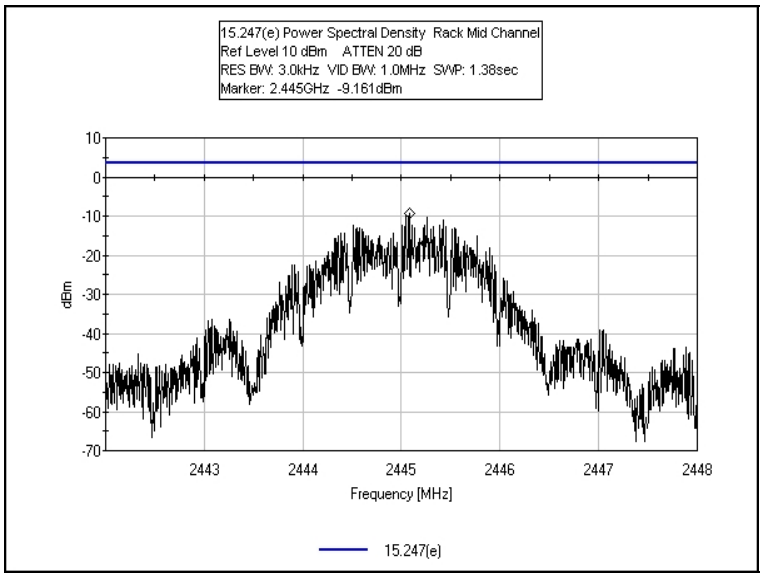
T1=Cable ANP04276 25'

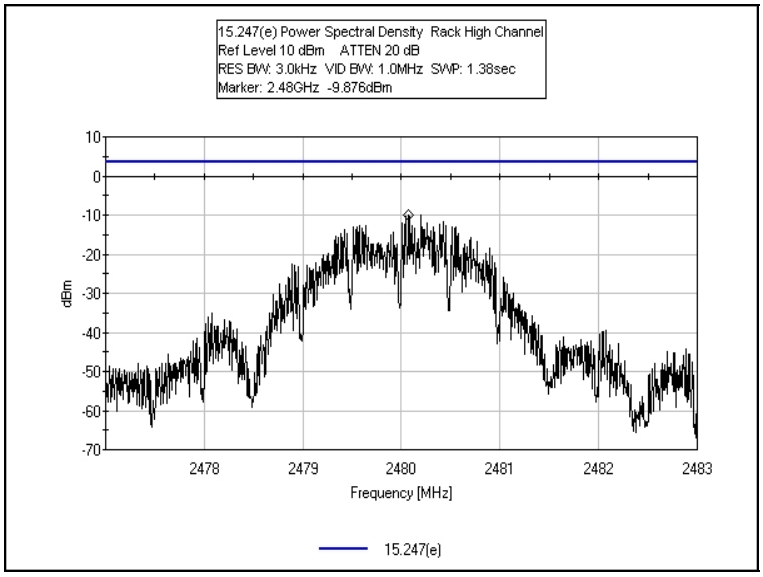
Measurement Data: Reading listed by margin. Test Distance: None

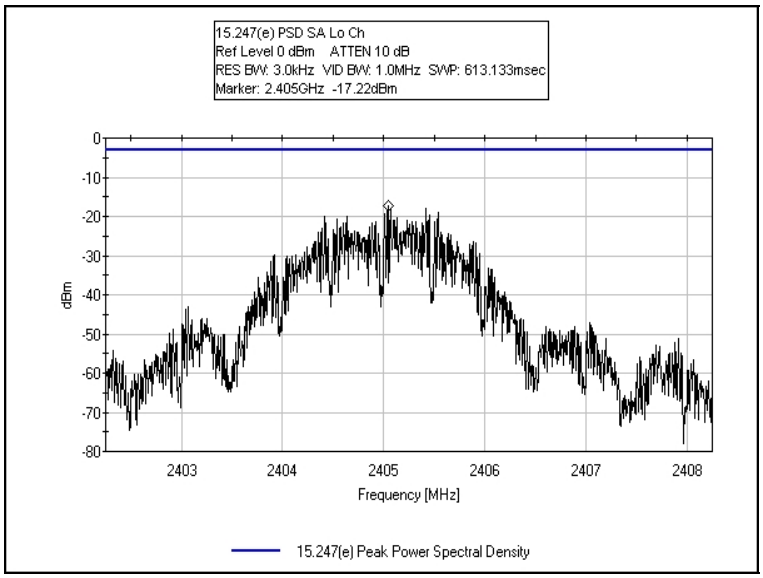
#	Freq MHz	Rdng dBµV	T1 dB	dB	dB	dB	Dist Table	Corr dBm	Spec dBm	Margin dB	Polar Ant
1	2405.073M	-30.1	+2.3				+0.0	-27.8	8.0 Low Channel	-35.8	None
2	2480.071M	-30.8	+2.4				+0.0	-28.4	8.0 High Channel	-36.4	None
3	2445.073M	-33.9	+2.3				+0.0	-31.6	8.0 Mid Channel	-39.6	None

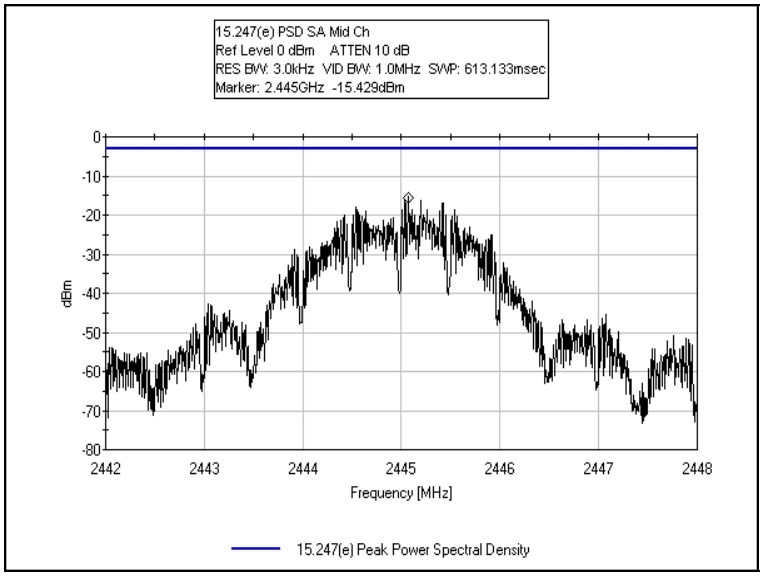
Test Plots

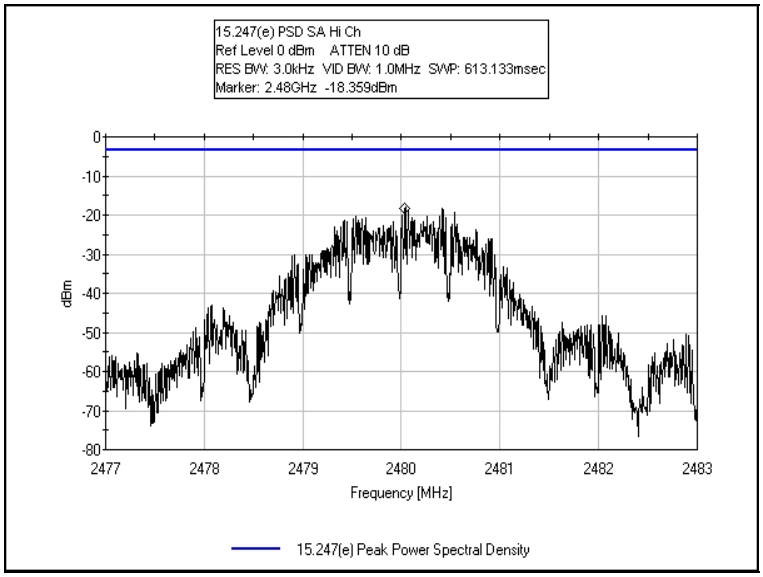

15.247(e) Power Spectral Density Lo Channel (0)
Ref Level 10 dBm ATTEN 20 dB
RES BW: 3.0kHz VID BW: 1.0MHz SWP: 1.38sec
Marker: 2.405GHz -8.53dBm
10
0
-10
-20
-30
-40
-50
-60
-70
dBm
2403
2404
2405
2406
2407
2408
Frequency [MHz]
15.247(e)


15.247(e) Power Spectral Density Rack Mid Channel
Ref Level 10 dBm ATTEN 20 dB
RES BW: 3.0kHz VID BW: 1.0MHz SWP: 1.38sec
Marker: 2.445GHz -9.161dBm
10
0
-10
-20
-30
-40
-50
-60
-70
dBm
2443
2444
2445
2446
2447
2448
Frequency [MHz]
15.247(e)


15.247(e) Power Spectral Density Rack High Channel
Ref Level 10 dBm ATTEN 20 dB
RES BW: 3.0kHz VID BW: 1.0MHz SWP: 1.38sec
Marker: 2.48GHz -9.876dBm
10
0
-10
-20
-30
-40
-50
-60
-70
dBm
2478
2479
2480
2481
2482
2483
Frequency [MHz]
15.247(e)


15.247(e) PSD SA Lo Ch
Ref Level 0 dBm ATTEN 10 dB
RES BW: 3.0kHz VID BW: 1.0MHz SWP: 613.133msec
Marker: 2.405GHz -17.22dBm
0
-10
-20
-30
-40
-50
-60
-70
-80
dBm
2403
2404
2405
2406
2407
2408
Frequency [MHz]
15.247(e) Peak Power Spectral Density


15.247(e) PSD SA Mid Ch
Ref Level 0 dBm ATTEN 10 dB
RES BW: 3.0kHz VID BW: 1.0MHz SWP: 613.133msec
Marker: 2.445GHz -15.429dBm
0
-10
-20
-30
-40
-50
-60
-70
-80
dBm
2442
2443
2444
2445
2446
2447
2448
Frequency [MHz]
15.247(e) Peak Power Spectral Density


15.247(e) PSD SA Hi Ch
Ref Level 0 dBm ATTEN 10 dB
RES BW: 3.0kHz VID BW: 1.0MHz SWP: 613.133msec
Marker: 2.48GHz -18.359dBm
0
-10
-20
-30
-40
-50
-60
-70
-80
dBm
2477
2478
2479
2480
2481
2482
2483
Frequency [MHz]
15.247(e) Peak Power Spectral Density