Measurement of RF Interference from Gas Monitors, Model Nos. Ventis Pro 4 and Ventis Pro 5

For	Industrial Scientific Corporation One Life Way Pittsburgh, PA 15205
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REVISION HISTORY

Revision	Date	Description
—	03/22/2019	Initial release

Measurement of RF Emissions from Gas Monitors, Model Nos. Ventis Pro 4 and Ventis Pro 5

1. INTRODUCTION

1.1 Scope of Tests

This document represents the results of the series of radio interference measurements performed on Industrial Scientific Corporation Gas Monitors, Model Nos. Ventis Pro 4 and Ventis Pro 5, transceivers (hereinafter referred to as the EUT). The EUTs are digital modulation transceivers. The transceivers were designed to transmit and receive in the 2400-2483.5 MHz band using an internal, non-removable ceramic chip antenna, Pulse Model No. W3008. The antenna has a gain of 1.1dBi. The EUTs were manufactured and submitted for testing by Industrial Scientific Corporation located in Pittsburgh, PA.

1.2 Purpose

The test series was performed to determine if the EUTs meet the conducted RF emission requirements, radiated RF emissions requirements, and additional provisions of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart B, Sections 15.107 and 15.109, for receivers and Subpart C, Sections 15.207 and 15.247 for Intentional Radiators Operating within the 2400-2483.5 MHz band.

The test series was also performed to determine if the EUTs meet the conducted RF emission requirements, radiated RF emissions requirements, and additional provisions of the Innovation, Science, and Economic Development Canada Radio Standards Specification RSS-Gen Section 8.8 and Section 7.3 for receivers and Innovation, Science, and Economic Development Canada Radio Standards Specification RSS-Gen Section 8.8 and Industry Canada Radio Standards Specification RSS-247 for Transmitters.

Testing was performed in accordance with ANSI C63.10-2013.

Per Industrial Scientific Corporation personnel, the Ventis Pro 4 and Ventis Pro 5 are electrically similar to each other. Both models use the same WiFi chipset, TI CC3220, and antenna, Pulse W30008. The Ventis Pro 4 has fewer features than the Ventis Pro 5.

All antenna port conducted tests were performed on a single PCB which contained the WiFi chipset. Complete case spurious radiated emissions tests were performed on the Ventis Pro 5 only since preliminary case spurious radiated emissions tests performed on the Ventis Pro 4 and the Ventis Pro 5 demonstrated that the worst case spurious emissions were from the Ventis Pro 5.

1.3 Deviations, Additions and Exclusions

There were no deviations, additions to, or exclusions from the test specification during this test series

1.4 EMC Laboratory Identification

This series of tests was performed by Elite Electronic Engineering Incorporated of Downers Grove, Illinois. The laboratory is accredited by the American Association for Laboratory Accreditation (A2LA), A2LA Lab Code: 1786-01.

1.5 Laboratory Conditions

The temperature at the time of the test was 21C and the relative humidity was 18%.

2. APPLICABLE DOCUMENTS

The following documents of the exact issue designated form part of this document to the extent specified herein:

- Federal Communications Commission "Code of Federal Regulations", Title 47, Part 15, Subparts B and C

- ANSI C63.4-2014, "American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz

to 40 GHz”

- ANSI C63.10-2013, "American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices”

- Federal Communications Commission Office of Engineering and Technology Laboratory Division, Guidance For Performing Compliance Measurements On Digital Transmissions Systems (DTS) Operating Under §15.247
  February 11, 2019

- Industry Canada RSS-247, Issue 2, February 2017, “Spectrum Management and Telecommunications Radio Standards Specification, Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs), and License-Exempt Local Area Network (LE-LAN) Devices”

- Industry Canada RSS-GEN, Issue 5, April 2018, “Spectrum Management and Telecommunications Radio Standards Specification, General Requirements for Compliance of Radio Apparatus”

3. EUT SET-UP AND OPERATION

3.1 General Description

The EUTs are Gas Monitors, Model Nos. Ventis Pro 4 and Ventis Pro 5. A block diagram of the EUT setup is shown as Figure 1 and Figure 2. Photographs of the EUTs are shown as Figure 3.

3.1.1 Power Input

The EUTs were powered by 3.6VDC from an internal, rechargeable, lithium ion battery pack.

3.1.2 Peripheral Equipment

The following peripheral equipment was submitted with the EUTs:

Item	Description
Laptop computer	Dell Latitude used to program the WiFi PCB during antenna port conducted tests

3.1.3 Interconnect Cables

The following interconnect cables were submitted with the EUT:

Item	Description
USB to RS-232 cable	Used to connect the WiFi PCB to the laptop computer

3.1.4 Grounding

The EUTs were ungrounded during the tests.

3.2 Software

For all tests the EUTs had Firmware Version 02.00.50 loaded onto the device to provide correct load characteristics.

3.3 Operational Mode

For antenna port conducted tests, the EUT was programmed to operate separately in each of the following modes:

- Transmit at 2412MHz, 802.11b, 1Mbps, power = 0
- Transmit at 2437MHz, 802.11b, 1Mbps, power = 0
- Transmit at 2462MHz, 802.11b, 1Mbps, power = 0

- Transmit at 2412MHz, 802.11b, 2Mbps, power = 0
- Transmit at 2437MHz, 802.11b, 2Mbps, power = 0
- Transmit at 2462MHz, 802.11b, 2Mbps, power = 0

- Transmit at 2412MHz, 802.11b, 5.5Mbps, power = 0
- Transmit at 2437MHz, 802.11b, 5.5Mbps, power = 0
- Transmit at 2462MHz, 802.11b, 5.5Mbps, power = 0
-
- Transmit at 2412MHz, 802.11b, 11Mbps, power = 0
- Transmit at 2437MHz, 802.11b, 11Mbps, power = 0
- Transmit at 2462MHz, 802.11b, 11Mbps, power = 0

- Transmit at 2412MHz, 802.11g, 6Mbps, power = 0
- Transmit at 2437MHz, 802.11g, 6Mbps, power = 0
- Transmit at 2462MHz, 802.11g, 6Mbps, power = 0
-
- Transmit at 2412MHz, 802.11g, 9Mbps, power = 0
- Transmit at 2437MHz, 802.11g, 9Mbps, power = 0
- Transmit at 2462MHz, 802.11g, 9Mbps, power = 0

- Transmit at 2412MHz, 802.11g, 12Mbps, power = 0
- Transmit at 2437MHz, 802.11g, 12Mbps, power = 0
- Transmit at 2462MHz, 802.11g, 12Mbps, power = 0

- Transmit at 2412MHz, 802.11g, 18Mbps, power = 0
- Transmit at 2437MHz, 802.11g, 18Mbps, power = 0
- Transmit at 2462MHz, 802.11g, 18Mbps, power = 0

- Transmit at 2412MHz, 802.11g, 24Mbps, power = 0
- Transmit at 2437MHz, 802.11g, 24Mbps, power = 0
- Transmit at 2462MHz, 802.11g, 24Mbps, power = 0

- Transmit at 2412MHz, 802.11g, 36Mbps, power = 0
- Transmit at 2437MHz, 802.11g, 36Mbps, power = 0
- Transmit at 2462MHz, 802.11g, 36Mbps, power = 0

- Transmit at 2412MHz, 802.11g, 48Mbps, power = 0
- Transmit at 2437MHz, 802.11g, 48Mbps, power = 0
- Transmit at 2462MHz, 802.11g, 48Mbps, power = 0

- Transmit at 2412MHz, 802.11g, 54Mbps, power = 0
- Transmit at 2437MHz, 802.11g, 54Mbps, power = 0
- Transmit at 2462MHz, 802.11g, 54Mbps, power = 0

- Transmit at 2412MHz, 802.11n, MCS0, power = 0
- Transmit at 2437MHz, 802.11n, MCS0, power = 0
- Transmit at 2462MHz, 802.11n, MCS0, power = 0

- Transmit at 2412MHz, 802.11n, MCS1, power = 0
- Transmit at 2437MHz, 802.11n, MCS1, power = 0
- Transmit at 2462MHz, 802.11n, MCS1, power = 0

- Transmit at 2412MHz, 802.11n, MCS2, power = 0
- Transmit at 2437MHz, 802.11n, MCS2, power = 0
- Transmit at 2462MHz, 802.11n, MCS2, power = 0

- Transmit at 2412MHz, 802.11n, MCS3, power = 0
- Transmit at 2437MHz, 802.11n, MCS3, power = 0
- Transmit at 2462MHz, 802.11n, MCS3, power = 0

- Transmit at 2412MHz, 802.11n, MCS4, power = 0
- Transmit at 2437MHz, 802.11n, MCS4, power = 0
- Transmit at 2462MHz, 802.11n, MCS4, power = 0

- Transmit at 2412MHz, 802.11n, MCS5, power = 0
- Transmit at 2437MHz, 802.11n, MCS5, power = 0
- Transmit at 2462MHz, 802.11n, MCS5, power = 0

- Transmit at 2412MHz, 802.11n, MCS6, power = 0
- Transmit at 2437MHz, 802.11n, MCS6, power = 0
- Transmit at 2462MHz, 802.11n, MCS6, power = 0

- Transmit at 2412MHz, 802.11n, MCS7, power = 0
- Transmit at 2437MHz, 802.11n, MCS7, power = 0
- Transmit at 2462MHz, 802.11n, MCS7, power = 0

For spurious radiated emissions tests, the EUT was programmed to operate separately in each of the following modes:

- Transmit at 2412MHz, 802.11b, 5.5Mbps, power = 0
- Transmit at 2437MHz, 802.11b, 5.5Mbps, power = 0
- Transmit at 2462MHz, 802.11b, 5.5Mbps, power = 0

- Transmit at 2412MHz, 802.11g, 36Mbps, power = 0
- Transmit at 2437MHz, 802.11g, 36Mbps, power = 0
- Transmit at 2462MHz, 802.11g, 36Mbps, power = 0

- Transmit at 2412MHz, 802.11n, MCS0, power = 0
- Transmit at 2437MHz, 802.11n, MCS0, power = 0
- Transmit at 2462MHz, 802.11n, MCS0, power = 0

3.4 EUT Modifications

No modifications were required for compliance.

4. TEST FACILITY AND TEST INSTRUMENTATION

4.1 Shielded Enclosure

All tests were performed in a 32ft. x 20ft. x 18ft. hybrid ferrite-tile/anechoic absorber lined test chamber. With the exception of the floor, the reflective surfaces of the shielded chamber are lined with ferrite tiles on the walls and ceiling. Anechoic absorber material is installed over the ferrite tile. The floor of the chamber is used as the ground plane. The chamber complies with ANSI C63.4-2014 for site attenuation.

4.2 Test Instrumentation

The test instrumentation and auxiliary equipment used during the tests are listed in Table 9-1.

4.3 Calibration Traceability

Test equipment is maintained and calibrated on a regular basis with a calibration interval not greater than two years. All calibrations are traceable to the International System Units (SI).

4.4 Measurement Uncertainty

All measurements are an estimate of their true value. The measurement uncertainty characterizes, with a specified confidence level, the spread of values which may be possible for a given measurement system.

Values of Expanded Measurement Uncertainty (95% Confidence) are presented below:

Measurement Type	Expanded Measurement Uncertainty
Conducted disturbance (mains port) (150 kHz – 30 MHz)	2.7
Radiated disturbance (electric field strength on an open area test site or alternative test site) (30 MHz – 1000 MHz)	4.3
Radiated disturbance (electric field strength on an open area test site or alternative test site) (1 GHz – 6 GHz)	3.1
Radiated disturbance (electric field strength on an open area test site or alternative test site) (6 GHz – 18 GHz)	3.2

5. TEST PROCEDURES

5.1 Receiver

Receivers operating above 960MHz are exempt from complying with the technical provisions.

5.2 Transmitter

5.2.1 Powerline Conducted Emissions

5.2.1.1 Requirements

Since the EUT was powered by internal batteries and has no connection for AC power, no conducted emissions tests are required.

5.2.2 6dB Bandwidth

5.2.2.1 Requirements

Per FCC 15.247(a)(2) and ISED RSS-247 section 5.2.(a), the minimum 6dB bandwidth shall be at least 500kHz for all systems using digital modulation techniques.

5.2.2.2 Procedures

a) The antenna port of the EUT was connected to the DUT 1 port of the Rohde & Schwarz OSP 120/OSP-B157 system via a coaxial cable and RF attenuator.

b) The Rohde & Schwarz OSP 120 RF switches were used to connect the inputs of the DUT ports (DUT 1, DUT 2, etc.) to the inputs of the ESW 44 EMI Test Receiver via a coaxial cable.

c) The EUT was powered up and set to transmit in the first mode listed in section 3.3.

d) The following settings were employed on the EMI Test Receiver:

1. Center Frequency = Transmit Frequency of the DUT
2. Frequency Span = 2 x Occupied Channel Bandwidth
3. RBW = 100kHz
4. VBW = 3 x RBW
5. Detector Mode = Max Peak
6. Trace Mode = Max Hold

e) Allow the trace to stabilize.

f) Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).

g) Determine the 6dB down amplitude.

h) Place two markers, one at the lowest frequency and the other at the highest frequency of the envelope trace, such that each marker is at or slightly below the 6dB down amplitude determined in step g). If a marker is below this 6dB down amplitude value, then it shall be as close as possible to this value. The occupied bandwidth is the frequency difference between the two markers.

i) Steps c) through h) were repeated for each of the modes listed in section 3.3.

5.2.2.3 Results

The plots on pages 27 through 86 show that the minimum 6 dB bandwidth was 8.4MHz which is greater than minimum allowable 6dB bandwidth requirement of 500kHz for systems using digital modulation techniques. The 99% bandwidth was measured to be 18.0MHz.

5.2.3 Peak Output Power

5.2.3.1 Requirements

For systems using digital modulation the maximum peak output conducted power shall not be greater than 1.0W (30dBm).

5.2.3.2 Procedures

a) The antenna port of the EUT was connected to the DUT 1 port of the Rohde & Schwarz OSP 120/OSP-B157 system via a coaxial cable and RF attenuator.

b) The Rohde & Schwarz OSP 120 RF switches were used to connect the inputs of the DUT ports (DUT 1, DUT 2, etc.) to the inputs of the ESW 44 EMI Test Receiver via a coaxial cable.

c) The EUT was powered up and set to transmit in the first mode listed in section 3.3.

d) The following settings were employed on the EMI Test Receiver:

1. Center Frequency = Transmit Frequency of the DUT
2. Frequency Span = 0 span
3. RBW = 20MHz
4. VBW = 80MHz
5. Detector Mode = Max Peak
6. Trace Mode = Max Hold
7. Sweep Points = 101
8. Sweep Time = 2 seconds

e) Record the highest value.

f) Steps c) through e) were repeated for each of the modes listed in section 3.3.

5.2.3.3 Results

The results are presented on pages 87 through 89. The maximum peak conducted output power from the transmitter was 0.174W (22.4 dBm) which is below the 1 Watt limit.

5.2.4 EIRP

5.2.4.1 Requirements

For systems using digital modulation the maximum peak output conducted power shall not be greater than 1.0W (30dBm). This limit is based on the use of antennas with directional gains that do not exceed 6dBi. Since the limit allows for a 6dBi antenna gain, the maximum EIRP can be increased by 6dB to 4 Watt (36dBm).

5.2.4.2 Procedures

The maximum transmit antenna gain of the EUT (in dBi) was added to the measured output power level (in dBm) to determine the maximum peak EIRP from the EUT (in dBm).

5.2.4.3 Results

The results are presented on pages 90 through 92. The maximum EIRP measured from the transmitter was 0.224W (23.5dBm) which is below the 4 Watt limit.

5.2.5 Duty Cycle Factor Measurements

5.2.5.1 Requirements

Per ANSI C63.10 section 11.6, when continuous transmission cannot be achieved and sweep triggering/signal gating cannot be implemented, alternative procedures are provided that can be used to measure the average power; however, they will require an additional measurement of the transmitter duty cycle (D). The duty cycle refers to the fraction of time over which the transmitter is ON and is transmitting.

5.2.5.2 Procedures

With the transmitter set up to transmit for maximum pulse density, the time domain trace is displayed on the spectrum analyzer. This trace is obtained by tuning center frequency to the transmitter frequency and then setting a zero span width with 500usec/div. The amplitude settings are adjusted so that the on/off transitions clear the 4th division from the bottom of the display. The markers are set at the beginning and end of the “on-time”. The trace is recorded. The ON time of each pulse is measured.

Next the spectrum analyzer center frequency is set to the transmitter frequency with a zero span width and 10msec/div. This shows if the word is longer than 100msec or shorter than 100msec. If the word period is less than 100msec, the display is set to show at least one word. The on-time and off-time are then measured. The on-time is total time signal level exceeds the 4th division. Off-time is time under for the word period. The duty cycle is then computed as the (On-time/ word period) where the word period = (On-time + Off-time).

5.2.5.3 Results

The plots of the duty cycle are shown on data pages 93 through 98. As can be seen from the data, the duty cycle correction factors were:

802.11b = 0.80dB
802.11g = 6.57dB
802.11n = 0.65dB

5.2.6 Radiated Spurious Emissions Measurements

5.2.6.1 Requirements

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated emissions measurement. Attenuation below the general limits specified in §15.209(a) (and RSS-Gen Table 5) is not required.

Radiated emissions which fall in the restricted bands, as defined in §15.205(a) (and RSS-Gen, Table 7) must comply with the radiated emission limits specified in §15.209(a) (and RSS-Gen, Table 5).

Paragraph 15.209(a) (and RSS-Gen, Table 5 and Table 6) has the following radiated emission limits:

Frequency MHz	Field Strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	3
30.0-88.0	100	3
88.0-216.0	150	3
216.0-960.0	200	3
Above 960	500	3

5.2.6.2 Procedures

Radiated measurements were performed in a 32ft. x 20ft. x 14ft. high shielded enclosure. The shielded enclosure prevents emissions from other sources, such as radio and TV stations from interfering with the measurements. All powerlines and signal lines entering the enclosure pass through filters on the enclosure wall. The powerline filters prevent extraneous signals from entering the enclosure on these leads.

Preliminary radiated emissions tests were performed to determine the emission characteristics of the EUT. For the preliminary test, a broadband measuring antenna was positioned at a 3 meter distance from the EUT. The entire frequency range from 30MHz to 25GHz was investigated using a peak detector function.

The final emission tests were then manually performed over the frequency range of 30MHz to 25GHz.

1) For all harmonics not in the restricted bands, the following procedure was used:
   a) The field strength of the fundamental was measured using a double ridged waveguide antenna. The waveguide antenna was positioned at a 3 meter distance from the EUT. The EUT was placed on a 1.5 meter high non-conductive stand. A peak detector with a resolution bandwidth of 100 kHz was used on the spectrum analyzer.
   b) The field strengths of all of the harmonics not in the restricted band were then measured using a double-ridged waveguide antenna. The waveguide antenna was positioned at a 3 meter distance from the EUT. The EUT was placed on a 1.5 meter high non-conductive stand. A peak detector with a resolution bandwidth of 100 kHz was used on the spectrum analyzer.
   c) To ensure that maximum or worst case emission levels at the fundamental and harmonics were measured, the following steps were taken when measuring the fundamental emissions and the spurious emissions:
      i) The EUT was rotated so that all of its sides were exposed to the receiving antenna.
      ii) Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.
      iii) The measuring antenna was raised and lowered for each antenna polarization to maximize the readings.
      iv) In instances where it was necessary to use a shortened cable between the measuring antenna and the spectrum analyzer. The measuring antenna was not raised or lowered to ensure maximized readings, instead the EUT was rotated through all axis to ensure the maximum readings were recorded for the EUT.
   d) All harmonics not in the restricted bands must be at least 20 dB below levels measured at the fundamental. However, attenuation below the general limits specified in §15.209(a) (and RSS-Gen, Table 5) is not required.
2) For all emissions in the restricted bands, the following procedure was used:
   a) The field strengths of all emissions below 1 GHz were measured using a bi-log antenna. The bi-log antenna was positioned at a 3 meter distance from the EUT. The EUT was placed on an 80cm high non-conductive stand. A peak detector with a resolution bandwidth of 100 kHz was used on the spectrum

analyzer.

b) The field strengths of all emissions above 1 GHz were measured using a double-ridged waveguide antenna. The waveguide antenna was positioned at a 3 meter distance from the EUT. The EUT was placed on a 1.5 meter high non-conductive stand. A peak detector with a resolution bandwidth of 1 MHz was used on the spectrum analyzer.

c) To ensure that maximum or worst case emission levels were measured, the following steps were taken when taking all measurements:

   i) The EUT was rotated so that all of its sides were exposed to the receiving antenna.

   ii) Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.

   iii) The measuring antenna was raised and lowered for each antenna polarization to maximize the readings.

   iv) In instances where it was necessary to use a shortened cable between the measuring antenna and the spectrum analyzer. The measuring antenna was not raised or lowered to ensure maximized readings, instead the EUT was rotated through all axis to ensure the maximum readings were recorded for the EUT.

d) For all radiated emissions measurements below 1 GHz, if the peak reading is below the limits listed in 15.209(a) (and RSS-Gen, Table 5), no further measurements are required. If however, the peak readings exceed the limits listed in 15.209(a) (and RSS-Gen, Table 5), then the emissions are remeasured using a quasi-peak detector.

e) For all radiated emissions measurements above 1 GHz, the peak readings must comply with the 15.35(b) limits. 15.35(b) states that when average radiated emissions measurements are specified, there also is a limit on the peak level of the radiated emissions. The limit on the peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test. Therefore, all peak readings above 1 GHz must be no greater than 20 dB above the limits specified in 15.209(a).

f) Next, for all radiated emissions measurements above 1GHz, the resolution bandwidth was set to 1MHz. The analyzer was set to linear mode with a 10Hz video bandwidth in order to simulate an average detector. An average reading was taken.

g) When continuous transmission cannot be achieved, the duty cycle correction factor is added to the reading to compute the emission level that would have been measured had the test been performed at 100% duty cycle.

5.2.6.3 Results

5.2.6.3.1 Ventis Pro 5

802.11b

Preliminary radiated emissions plots and final radiated emission data are presented on pages 99 through 131. As can be seen from the data, all emissions measured from the EUT were within the specification limits.

802.11g

Preliminary radiated emissions plots and final radiated emission data are presented on pages 132 through 164. As can be seen from the data, all emissions measured from the EUT were within the specification limits.

802.11n

Preliminary radiated emissions plots and final radiated emission data are presented on pages 165 through 197. As can be seen from the data, all emissions measured from the EUT were within the specification limits.

Photographs of the test configuration which yielded the highest, or worst case, radiated emission levels are shown in Figures 4 through 6.

5.2.6.3.2 Ventis Pro 4

802.11b

Preliminary radiated emissions plots are presented on pages 198 through 221.

802.11g

Preliminary radiated emissions plots are presented on pages 222 through 245.

802.11n

Preliminary radiated emissions plots are presented on pages 246 through 269.

Photographs of the test configuration which yielded the highest, or worst case, radiated emission levels are shown on Figures 7 through 9.

5.2.7 Band Edge Compliance

5.2.7.1 Requirements

Per FCC 15.247(d) and ISED RSS-247 section 5.5, the emissions at the band-edges must be at least 20dB below the highest level measured within the band but attenuation below the general limits listed in 15.209(a) and RSS-Gen is not required.

In addition, the radiated emissions which fall in the restricted band beginning at 2483.5 MHz must meet the general limits of 15.209(a) (and RSS-Gen, Table 5).

5.2.7.2 Procedures

5.2.7.2.1 Low Band Edge

a) The antenna port of the EUT was connected to the DUT 1 port of the Rohde & Schwarz OSP 120/OSP-B157 system via a coaxial cable and RF attenuator.

b) The Rohde & Schwarz OSP 120 RF switches were used to connect the inputs of the DUT ports (DUT 1, DUT 2, etc.) to the inputs of the ESW 44 EMI Test Receiver via a coaxial cable.

c) The EUT was powered up and set to transmit in the first mode listed in section 3.3.

d) The following settings were employed on the EMI Test Receiver:

Sweep 1:

1. Start Frequency = 2400MHz
2. Stop Frequency = 2483.5MHz
3. RBW = 100kHz
4. VBW = 300kHz
5. Detector Mode = Max Peak
6. Trace Mode = Max Hold
7. Sweep Points = 1670
8. Sweep Time = 1.67 msec
9. Sweep Count = 100

e) The highest value in Sweep 1 was recorded.

f) The limit line for sweep 2 was set at 20dB down from the highest value recorded in Sweep 1.

Sweep 2:

1. Start Frequency = 2310MHz
2. Stop Frequency = 2400MHz
3. RBW = 100kHz
4. VBW = 300kHz
5. Detector Mode = Max Peak

6. Trace Mode = Max Hold
7. Sweep Points = 1800
8. Sweep Time = 1.8 msec
9. Sweep Count = 100

g) The highest values in Sweep 2 were recorded and compared to the 20dB down limit which was determined from Sweep 1.

h) The two sweeps were combined and plotted.

i) Step d) through h) were repeated for all remaining modes listed in section 3.3 at the channel closest to the low band edge.

5.2.7.2.2 High Band Edge

a) The EUT was set to transmit continuously at the first mode listed in section 3.3 at the channel closest to the high band-edge.
b) A double ridged waveguide was placed 3 meters away from the EUT. The antenna was connected to the input of a spectrum analyzer.
c) The start frequency of the analyzer was set to the high band edge (2483.5MHz). The frequency span was set to 10MHz.
d) The resolution bandwidth was set to 1MHz.
e) To ensure that the maximum or worst case emission level was measured, the following steps were taken:

1. The EUT was rotated so that all of its sides were exposed to the receiving antenna.
2. Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.
3. The measuring antenna was raised and lowered from 1 to 4 meters for each antenna polarization to maximize the readings.

f) The highest measured peak reading was recorded.
g) The highest measured average reading was recorded.
h) Steps b) through g) were repeated for all remaining modes listed in section 3.3 at the channel closed to the high band-edge.

5.2.7.3 Results

Pages 270 through 295 show the band-edge compliance results. As can be seen from the data, the conducted emissions at the low end band-edge are within the 20 dB down limits. The radiated emissions at the high end band-edge are within the general limits.

5.2.8 Power Spectral Density

5.2.8.1 Requirement

Per FCC 15.247(f) and ISED RSS-247 section 5.2.(b), the peak power spectral density from the intentional radiator shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

5.2.8.2 Procedures

a) The antenna port of the EUT was connected to the DUT 1 port of the Rohde & Schwarz OSP 120/OSP-B157 system via a coaxial cable and RF attenuator.

b) The Rohde & Schwarz OSP 120 RF switches were used to connect the inputs of the DUT ports (DUT 1, DUT 2, etc.) to the inputs of the ESW 44 EMI Test Receiver via a coaxial cable.

c) The EUT was powered up and set to transmit in the first mode listed in section 3.3.

d) The following settings were employed on the EMI Test Receiver:

a. Center frequency = transmit frequency
b. Span = 30MHz
c. Resolution bandwidth (RBW): 3kHz ≤ RBW ≤ 100kHz
d. VBW = 3 x RBW
e. Sweep Points = 600
f. Sweep time = Auto
g. Sweep Count = 100
h. The peak detector and 'Max-Hold' function was engaged.
i. The display line represents the 8 dBm limit

e) If the measured value exceeds the 8dBm limit, the RBW was reduced (no less than 3kHz) and step d) was repeated.

5.2.8.3 Results

Pages 296 through 355 show the power spectral density results. As can be seen from the data, the peak power density is less than 8dBm in a 3kHz band during any time interval of continuous transmission.

6. CONCLUSIONS

The Industrial Scientific Corporation Gas Monitors, Model Nos. Ventis Pro 4 and Ventis Pro 5 digital modulation transceivers, did fully meet the conducted and radiated emission requirements of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart B, Sections 15.107 and 15.109 for receivers and Subpart C, Sections 15.207 and 15.247 for Intentional Radiators Operating within 2400-2483.5 when tested per ANSI C63.10-2013.

The Industrial Scientific Corporation Gas Monitors, Model Nos. Ventis Pro 4 and Ventis Pro 5 digital modulation transceivers, did also fully meet the conducted and radiated RF emission requirements of the Industry Canada Radio Standards Specification, RSS-Gen, Section 8.8 and Section 7.3 for receivers and the Industry Canada Radio Standards Specification RSS-Gen Section 8.8 and Radio Standards Specification RSS-247 for transmitters, when tested per ANSI C63.10-2013.

7. CERTIFICATION

Elite Electronic Engineering Incorporated certifies that the information contained in this report was obtained under conditions which meet or exceed those specified in the test specifications.

The data presented in this test report pertains to the EUT at the test date. Any electrical or mechanical modification made to the EUT subsequent to the specified test date will serve to invalidate the data and void this certification.

8. ENDORSEMENT DISCLAIMER

This report must not be used to claim product certification, approval, or endorsement by A2LA, NIST or any agency of the Federal Government.

9. EQUIPMENT LIST

Table 9-1 Equipment List

Eq ID	Equipment Description	Manufacturer	Model No.	Serial No.	Frequency Range	Cal Date	Due Date
APW0	PREAMPLIFIER	PLANAR ELECTRONICS	PE2-30-20G20R6G	PL2926/0646	20GHZ-26.5GHZ	4/5/2018	4/5/2019
APW11	PREAMPLIFIER	PMI	PE2-35-120-5R0-10-12-SFF	PL11685/1241	1GHZ-20GHZ	4/5/2018	4/5/2019
CDX8	COMPUTER	ELITE	WORKSTATION			N/A	
GRE2	SIGNAL GENERATOR	AGILENT	E4438C	MY42081749	250KHZ-6GHZ	3/6/2018	3/6/2019
GSFA	OSP-B157 OSP MODULE	ROHDE & SCHWARZ	OSP-B157	100867		10/23/2018	10/23/2019
GSFB	OSP120 BASE UNIT	ROHDE & SCHWARZ	OSP120	101246	---	10/23/2018	10/23/2019
NHG0	STANDARD GAIN HORN ANTENNA	NARDA	638	---	18-26.5GHZ	NOTE 1	
NTA4	BILOG ANTENNA	TESEQ	6112D	46660	20-2000GHZ	9/5/2018	9/5/2019
NWQ0	DOUBLE RIDGED WAVEGUIDE ANTENNA	ETS LINDGREN	3117	66657	1GHZ-18GHZ	5/31/2018	5/31/2020
NWQ2	DOUBLE RIDGED WAVEGUIDE ANTENNA	ETS LINDGREN	3117	66659	1GHZ-18GHZ	3/22/2018	3/22/2020
RBG2	EMI ANALYZER	ROHDE & SCHWARZ	ESW44	101591	2HZ-44GHZ	2/23/2018	2/23/2019
RBG3	EMI ANALYZER	ROHDE & SCHWARZ	ESW44	101592	2HZ-44GHZ	2/20/2019	2/20/2020
WKA1	SOFTWARE, UNIVERSAL RCV EMI	ELITE	UNIV_RCV_EMI	1	---	I/O	
XPR0	HIGH PASS FILTER	K&L MICROWAVE	11SH10-4800/X20000	001	4.8-20GHZ	9/12/2017	9/12/2019

I/O: Initial Only
N/A: Not Applicable
Note 1: For the purpose of this test, the equipment was calibrated over the specified frequency range, pulse rate, or modulation prior to the test or monitored by a calibrated instrument.

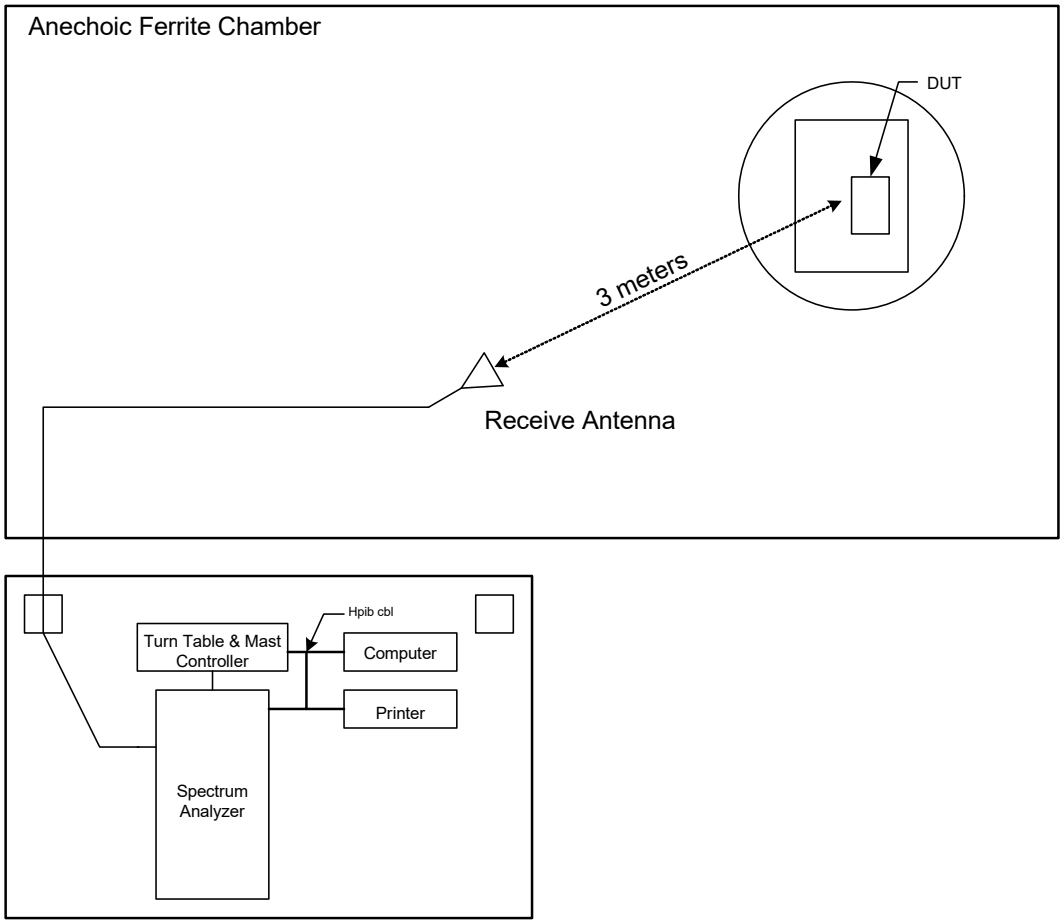


FIGURE 1 BLOCKDIAGRAM OF TEST SETUP

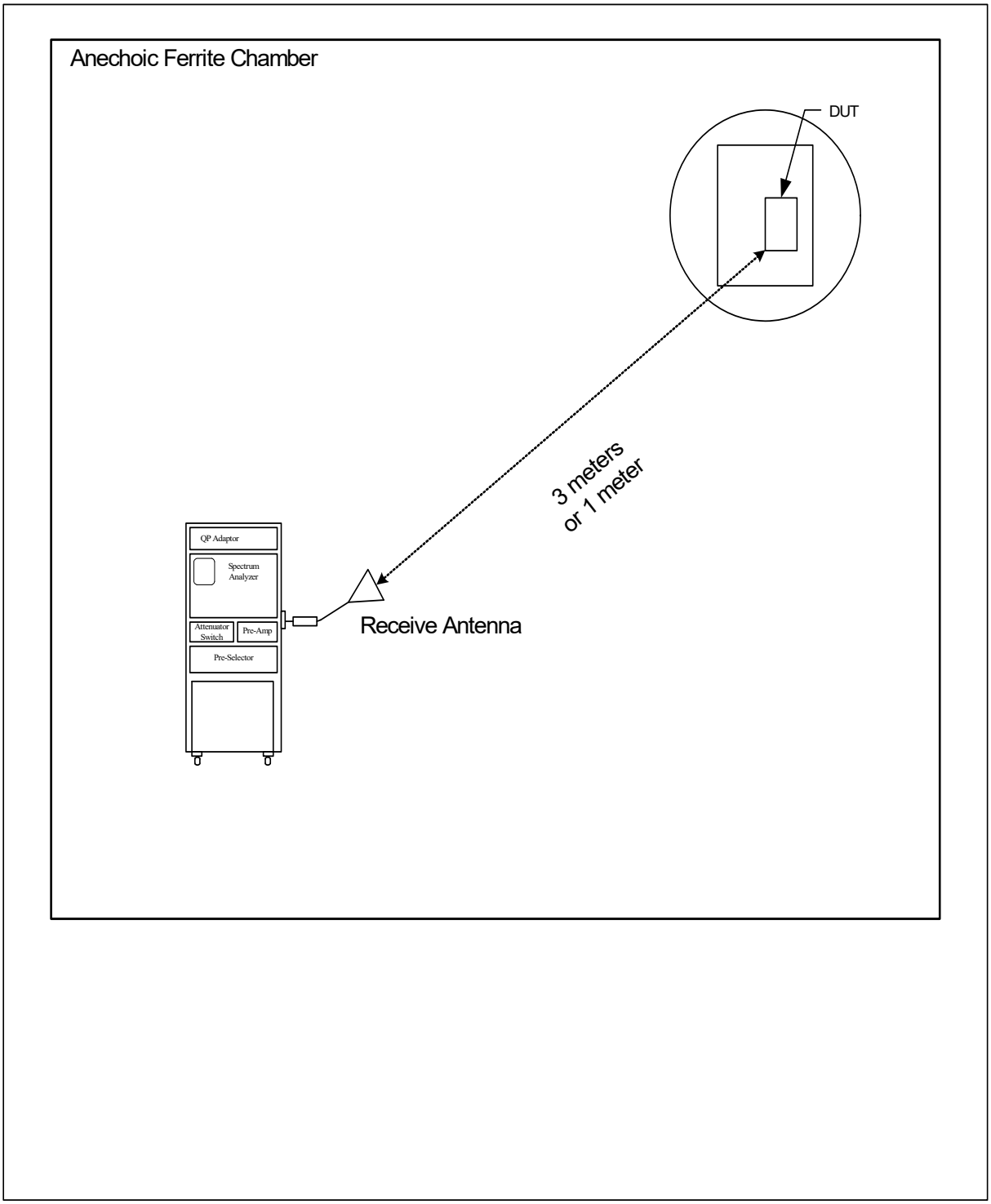


Figure 2: BLOCK DIAGRAM OF TEST SETUP FOR RADIATED EMISSIONS ABOVE 18GHZ

Figure 3

Photograph of Ventis Pro 4

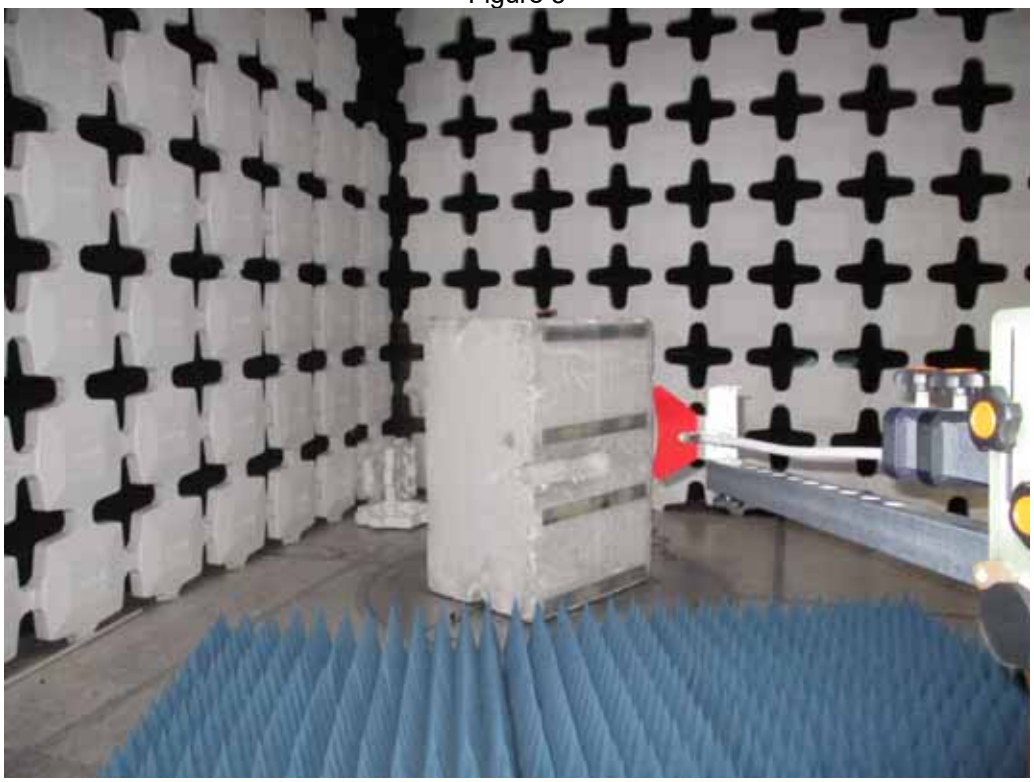
Photograph of Ventis Pro 5

Figure 4

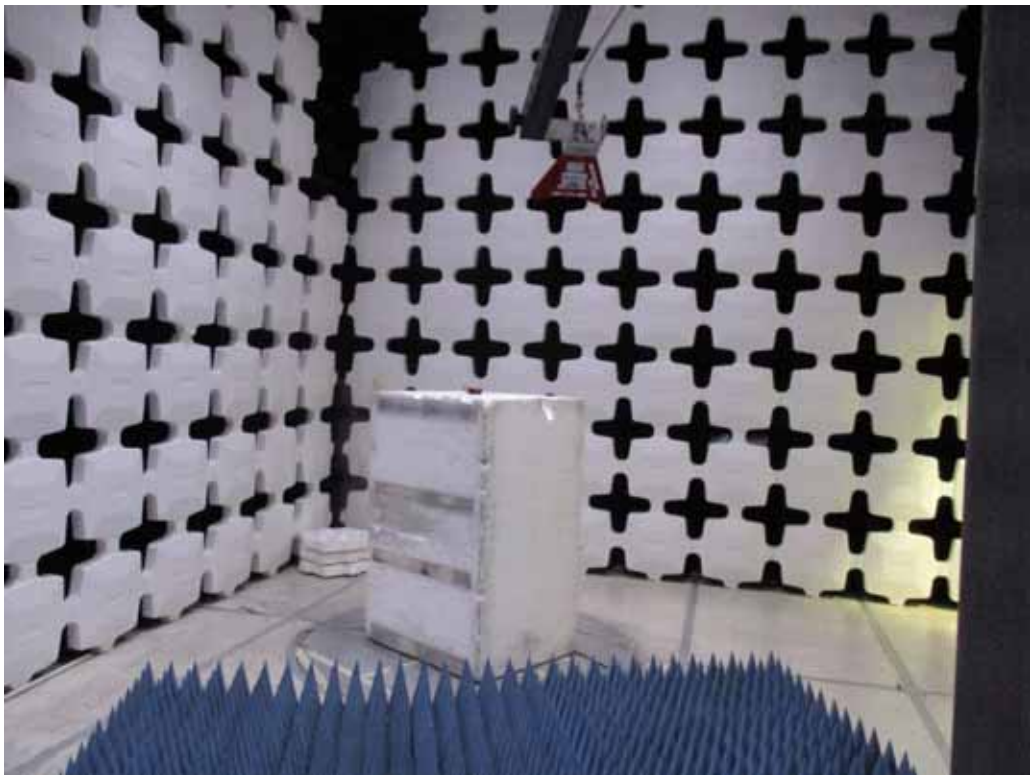
Test Setup for Radiated Emissions – 30MHz to 1GHz, Horizontal Polarization, Ventis Pro 5

Test Setup for Radiated Emissions – 30MHz to 1GHz, Vertical Polarization, Ventis Pro 5

Figure 5

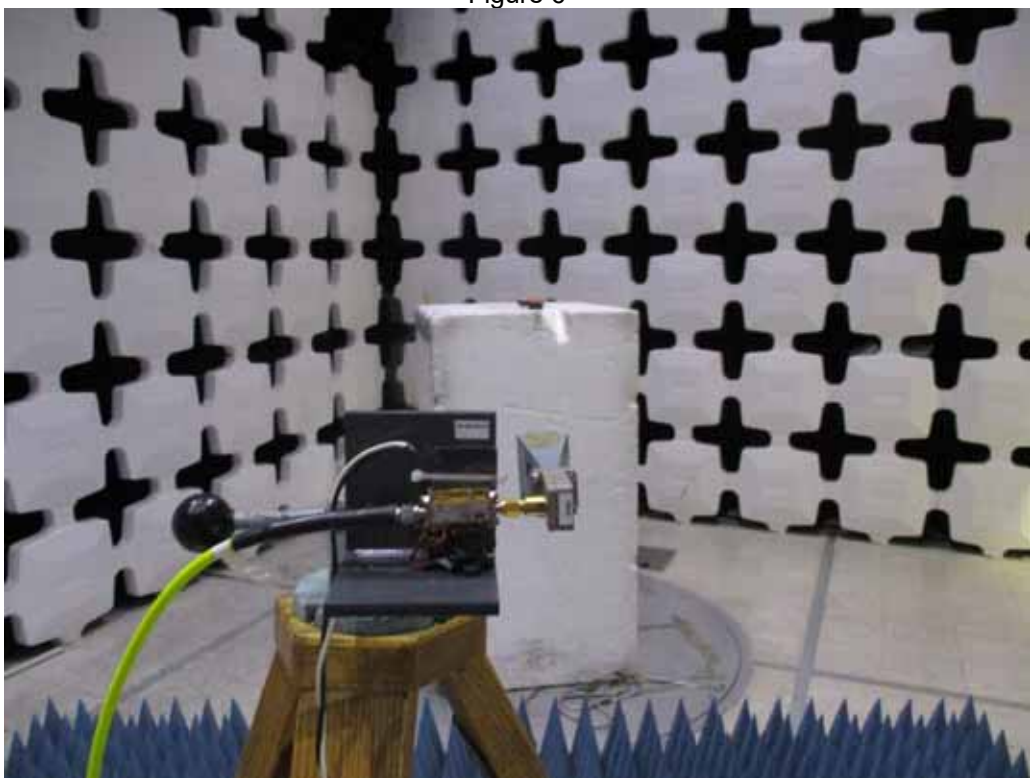


Test Setup for Radiated Emissions – 1GHz to 18GHz, Horizontal Polarization, Ventis Pro 5

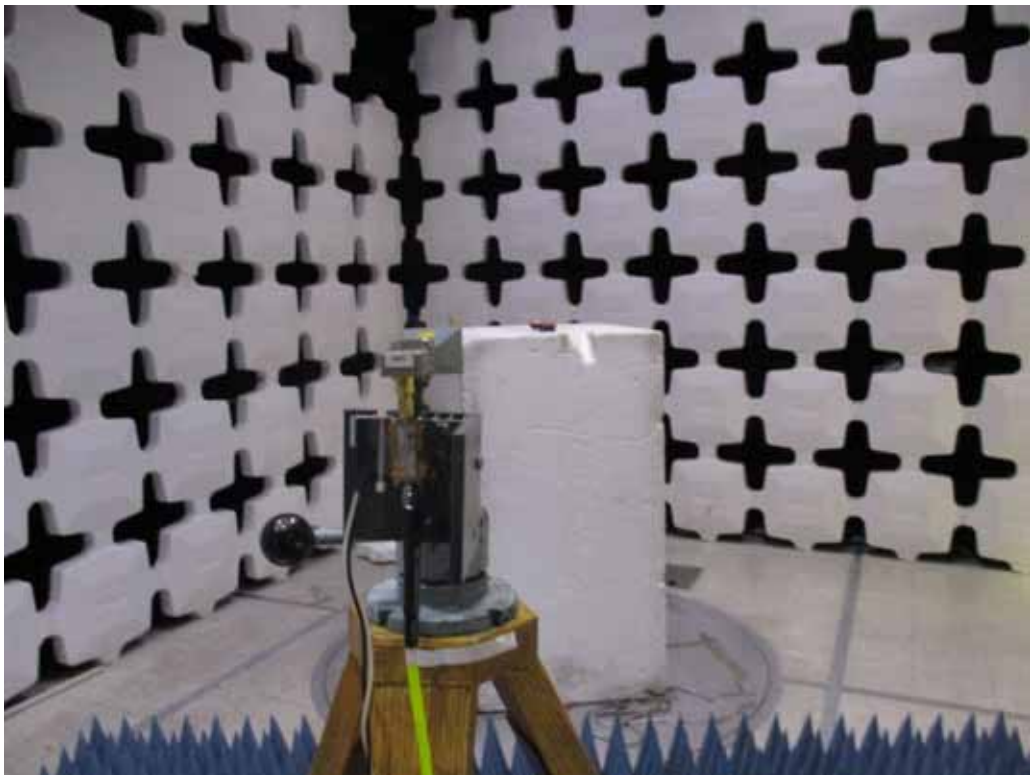


Test Setup for Radiated Emissions – 1GHz to 18GHz, Vertical Polarization Ventis Pro 5

Figure 6



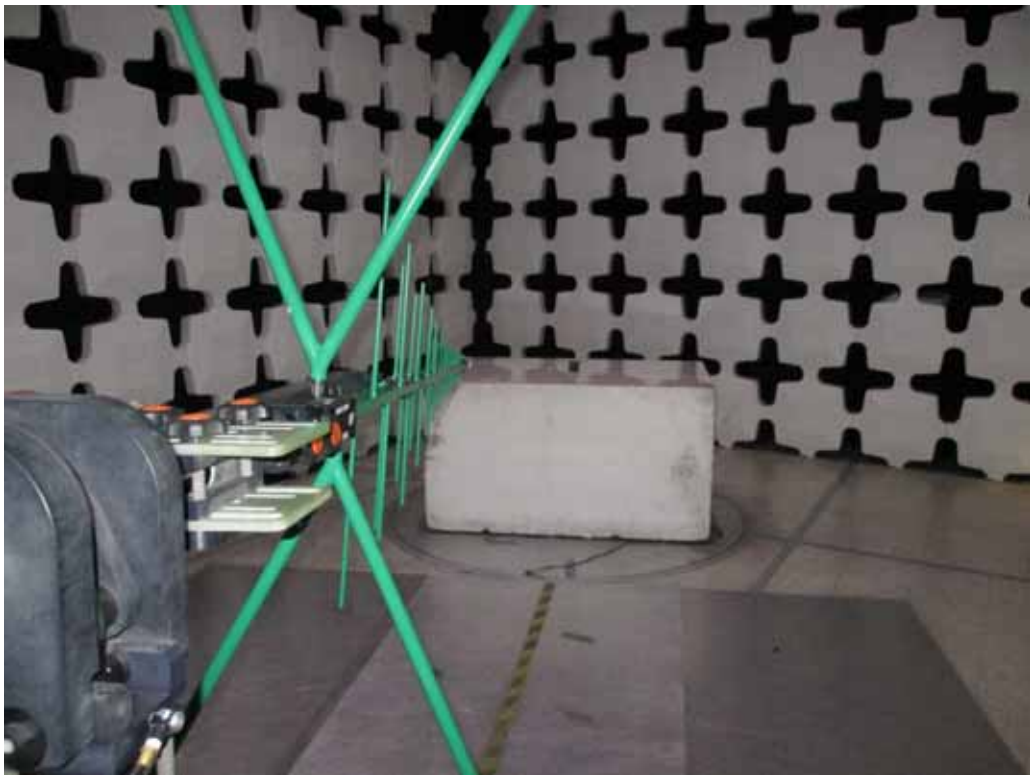
Test Setup for Radiated Emissions – 18GHz to 25GHz, Horizontal Polarization, Ventis Pro 5



Test Setup for Radiated Emissions – 18GHz to 25GHz, Vertical Polarization Ventis Pro 5

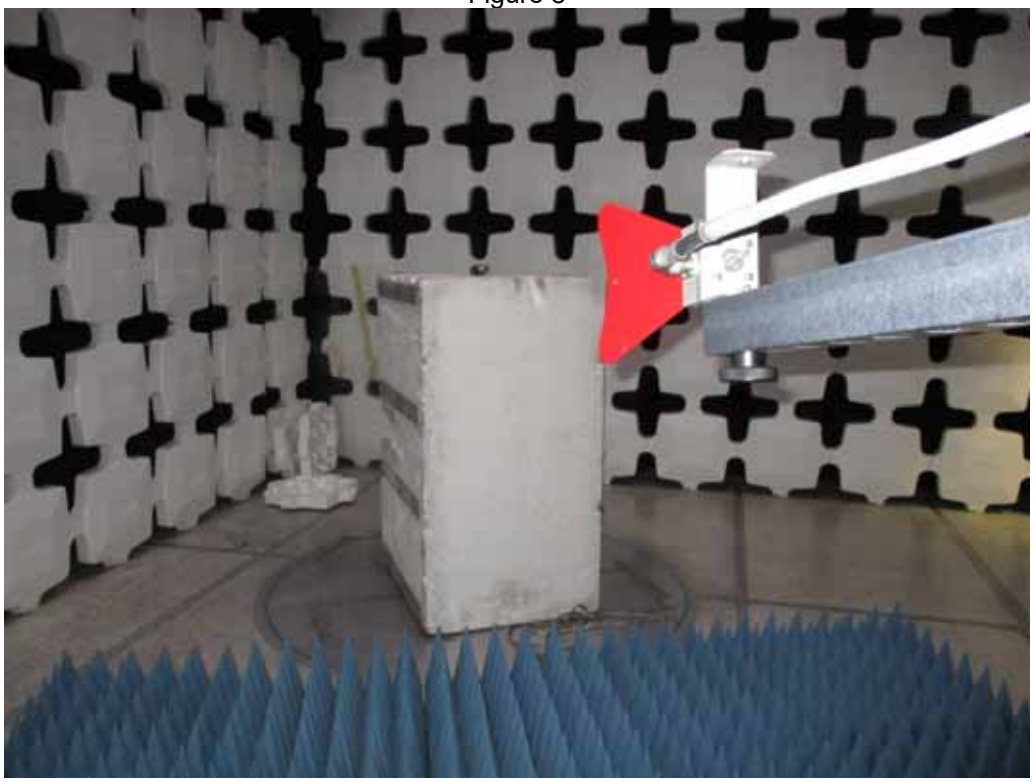
Figure 7

Test Setup for Radiated Emissions – 30MHz to 1GHz, Horizontal Polarization, Ventis Pro 4



Test Setup for Radiated Emissions – 30MHz to 1GHz, Vertical Polarization, Ventis Pro 4

Figure 8

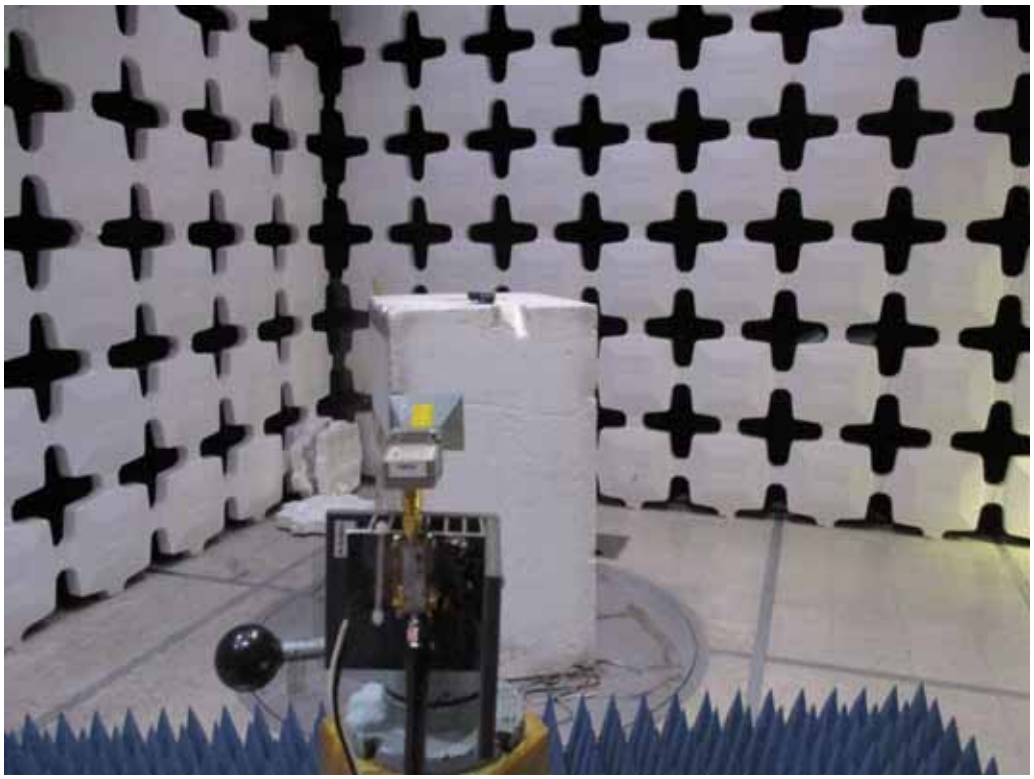


Test Setup for Radiated Emissions – 1GHz to 18GHz, Horizontal Polarization, Ventis Pro 4

Test Setup for Radiated Emissions – 1GHz to 18GHz, Vertical Polarization, Ventis Pro 4

Figure 9

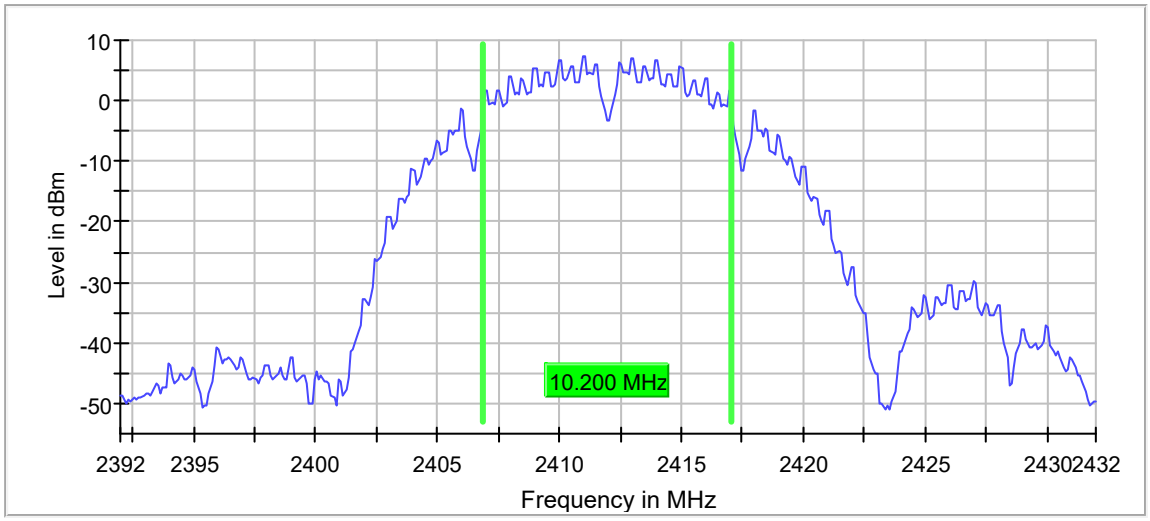
Test Setup for Radiated Emissions – 18GHz to 25GHz, Horizontal Polarization, Ventis Pro 4



Test Setup for Radiated Emissions – 18GHz to 25GHz, Vertical Polarization, Ventis Pro 4

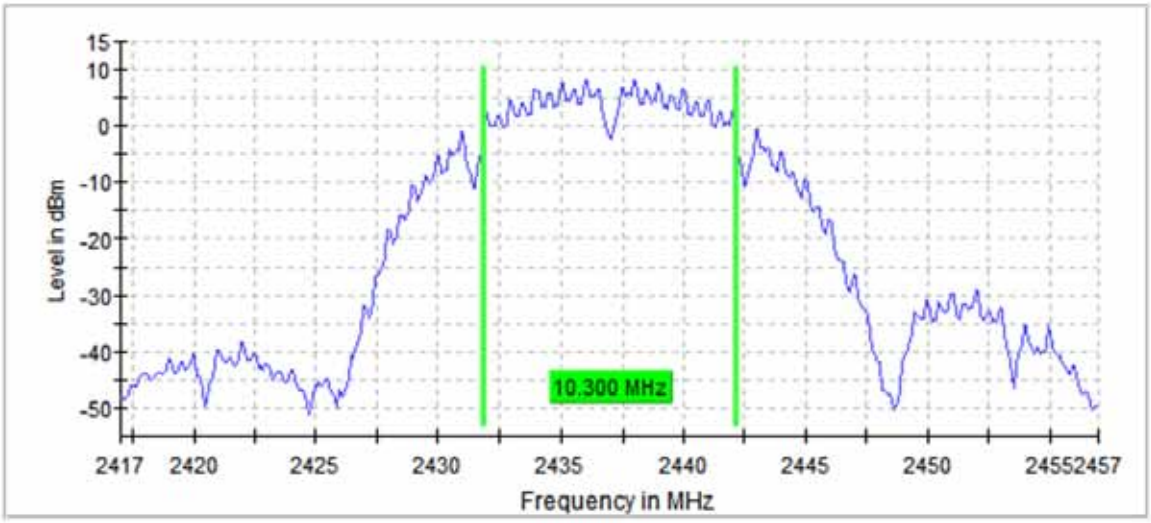
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2412MHz, 802.11b, 1Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2412	10.200000	0.500000	2406.850000	2417.050000	Pass



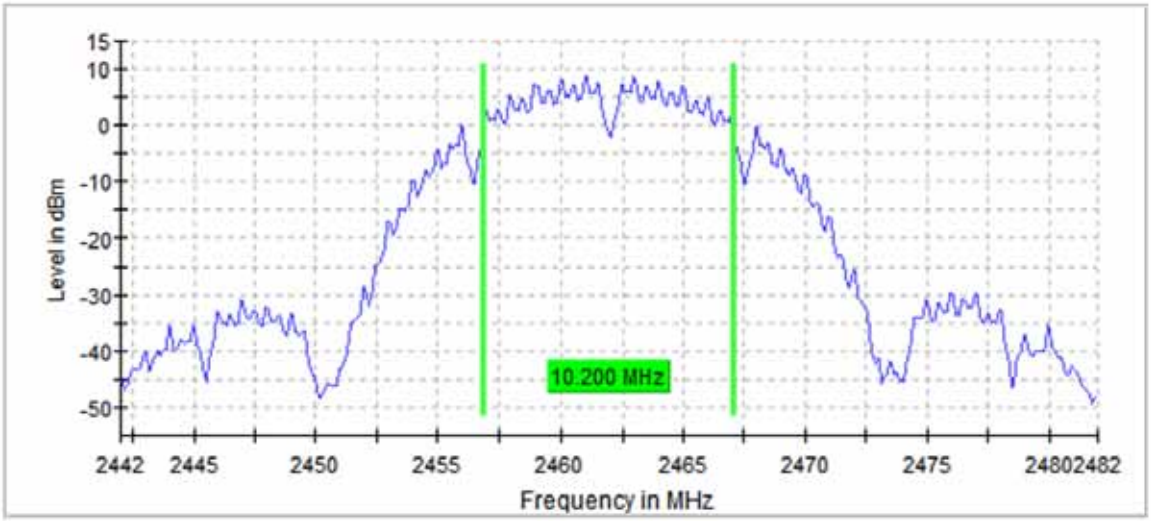
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2437MHz, 802.11b, 1Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437	10.300000	0.500000	2431.850000	2442.150000	Pass



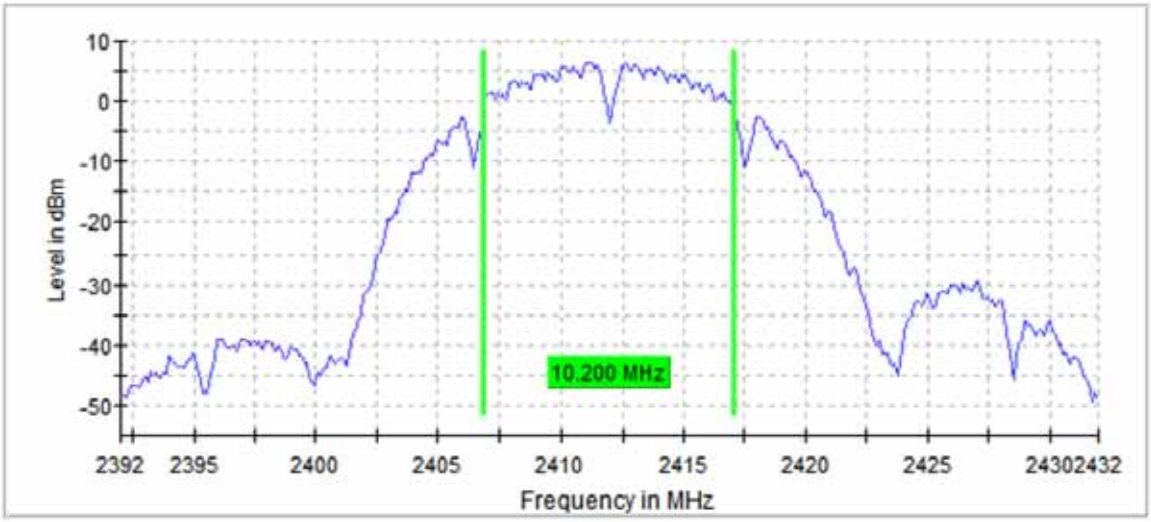
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2462MHz, 802.11b, 1Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2462	10.200000	0.500000	2456.850000	2467.050000	Pass



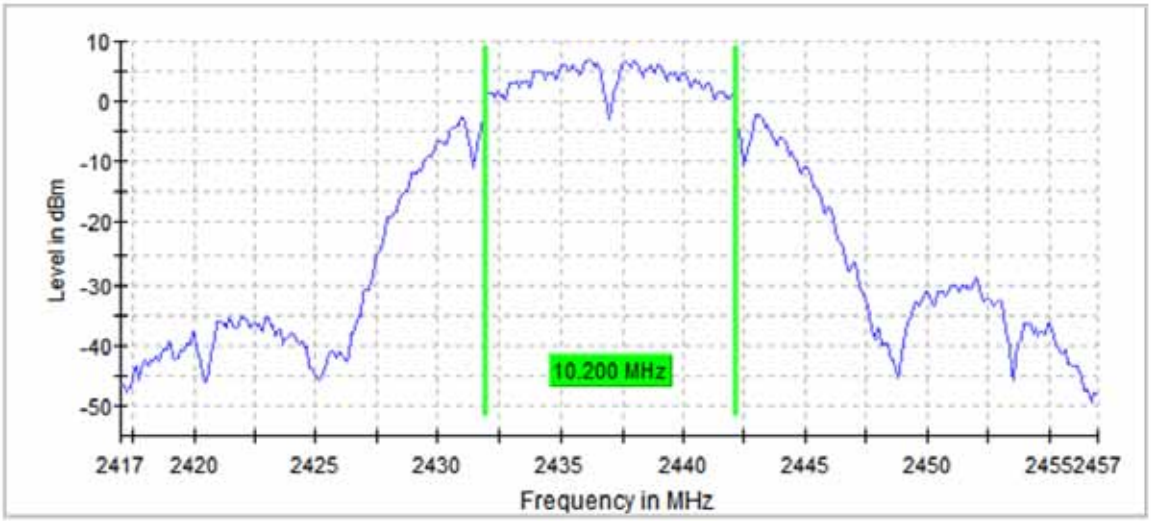
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2412MHz, 802.11b, 2Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2412	10.200000	0.500000	2406.850000	2417.050000	Pass



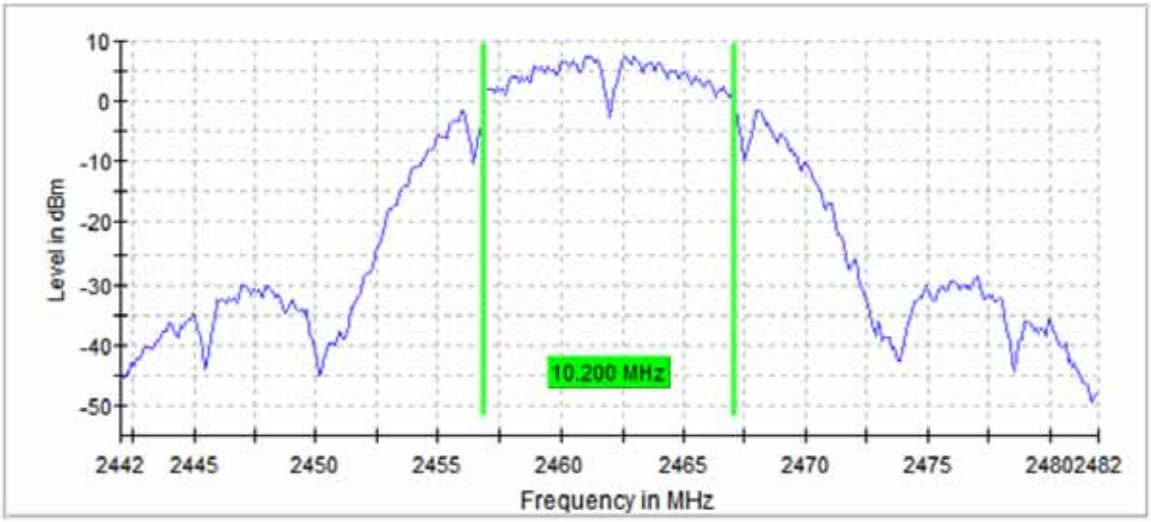
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2437MHz, 802.11b, 2Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437	10.200000	0.500000	2431.950000	2442.150000	Pass



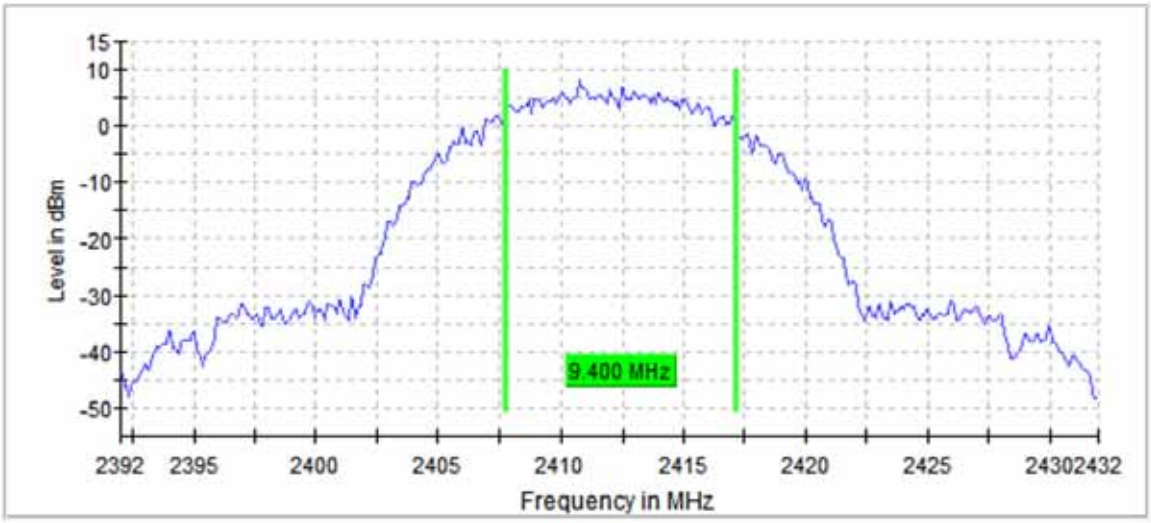
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2462MHz, 802.11b, 2Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2462	10.200000	0.500000	2456.850000	2467.050000	Pass



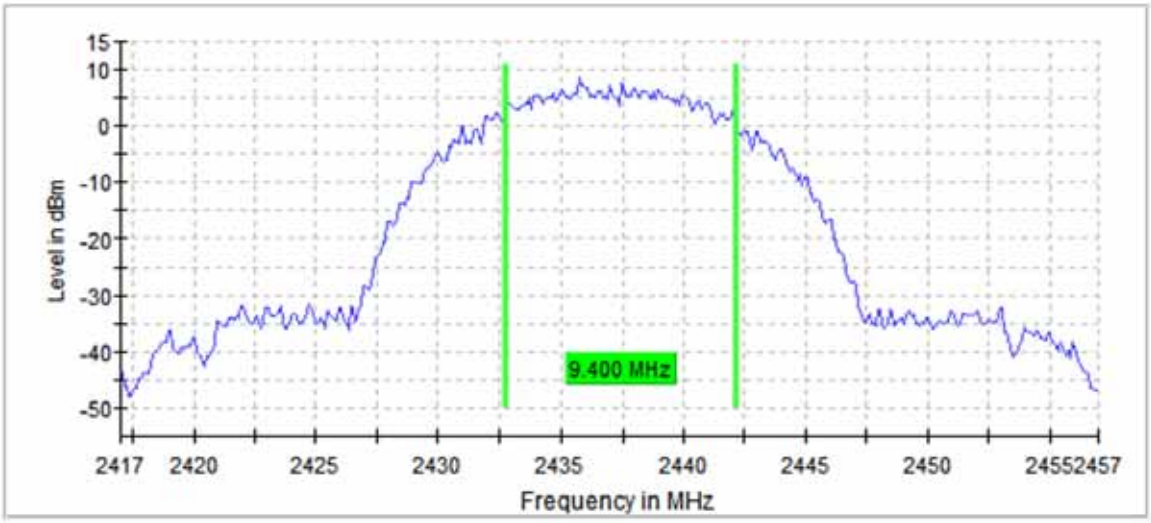
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2412MHz, 802.11b, 5.5Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2412	9.400000	0.500000	2407.750000	2417.150000	Pass



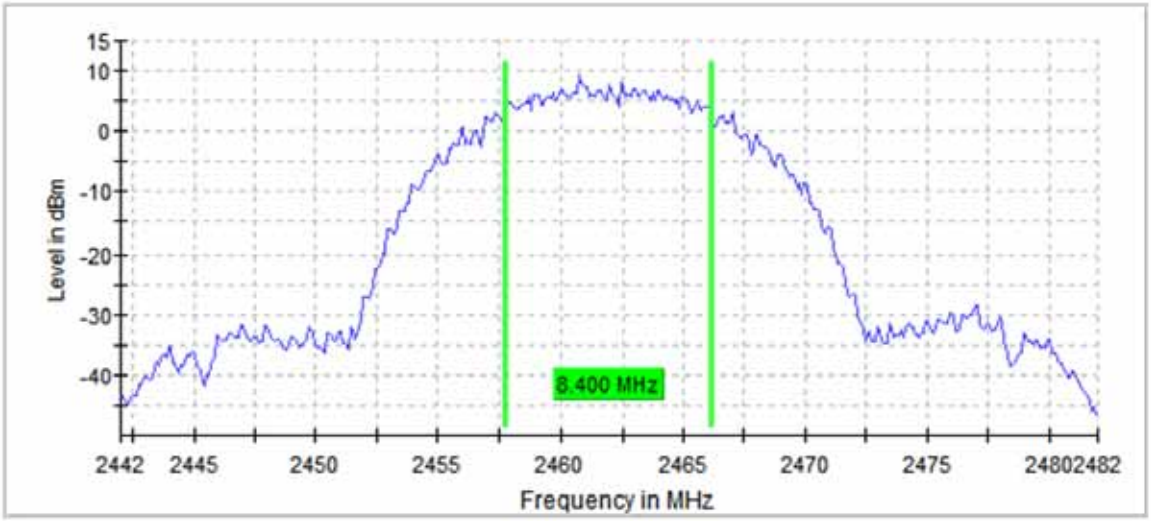
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2437MHz, 802.11b, 5.5Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437	9.400000	0.500000	2432.750000	2442.150000	Pass



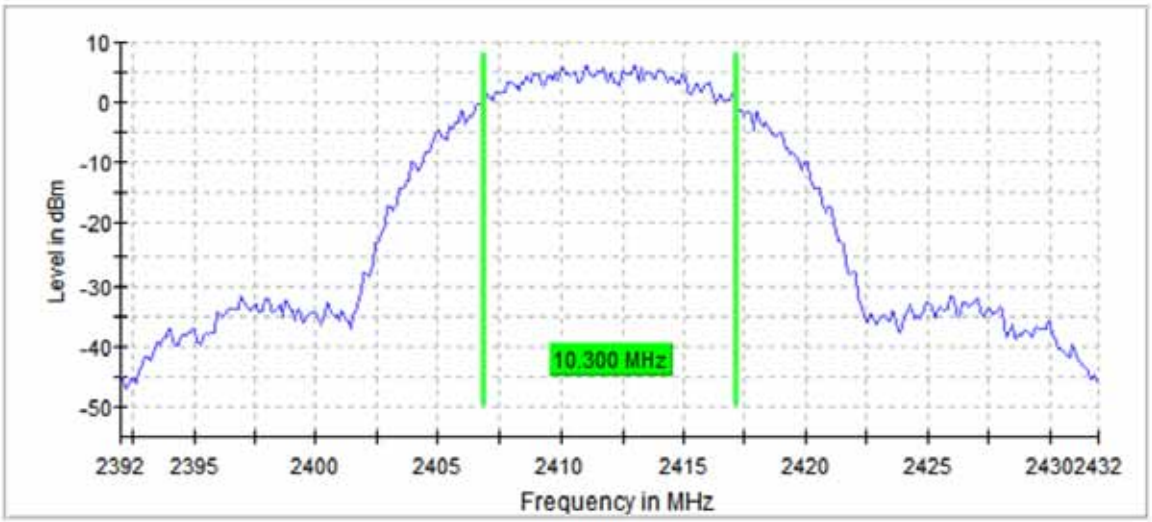
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2462MHz, 802.11b, 5.5bps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2462	8.400000	0.500000	2457.750000	2466.150000	Pass



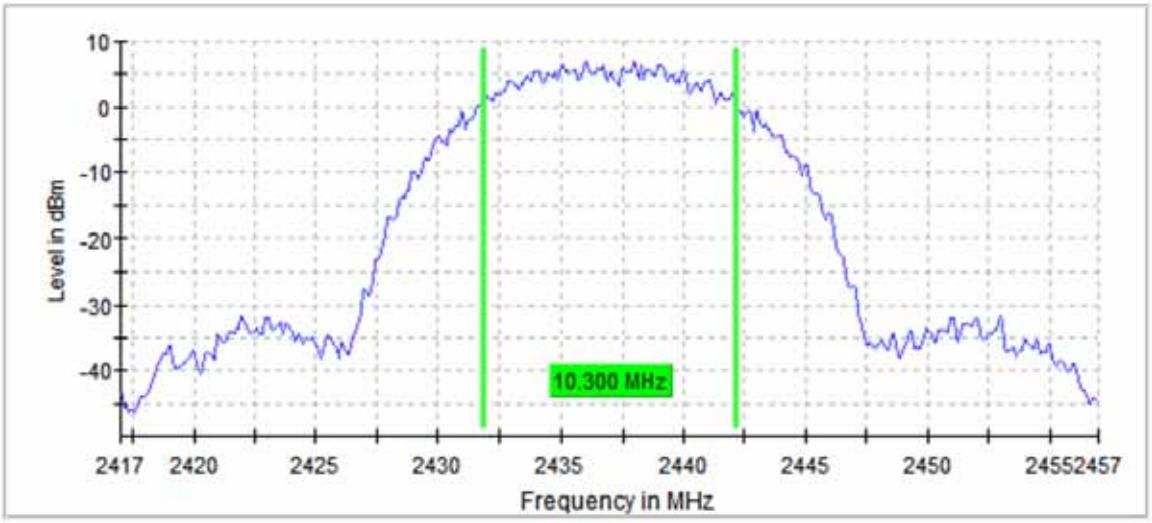
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2412MHz, 802.11b, 11Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2412	10.300000	0.500000	2406.850000	2417.150000	Pass



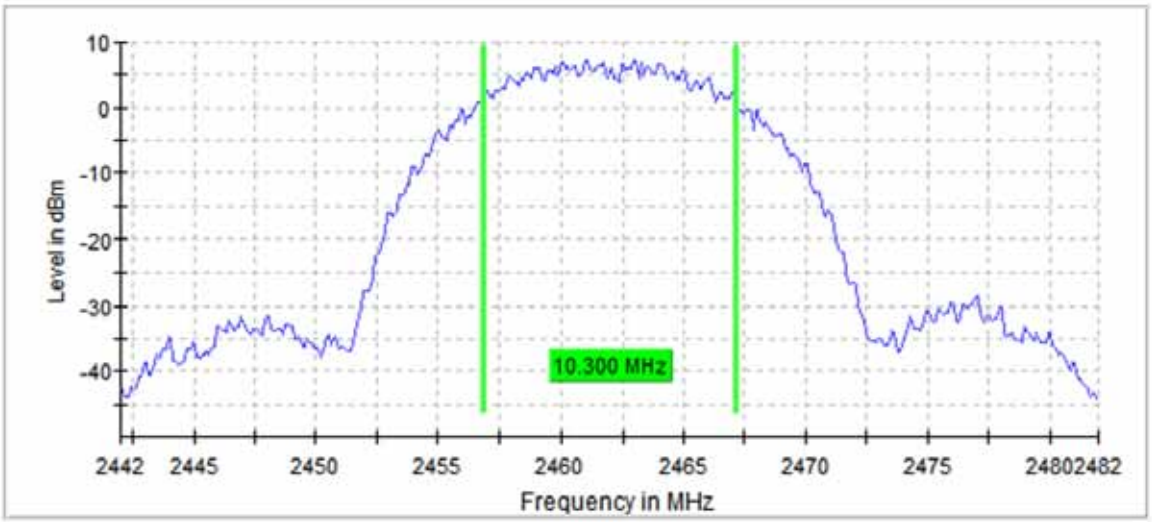
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2437MHz, 802.11b, 11Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437	10.300000	0.500000	2431.850000	2442.150000	Pass



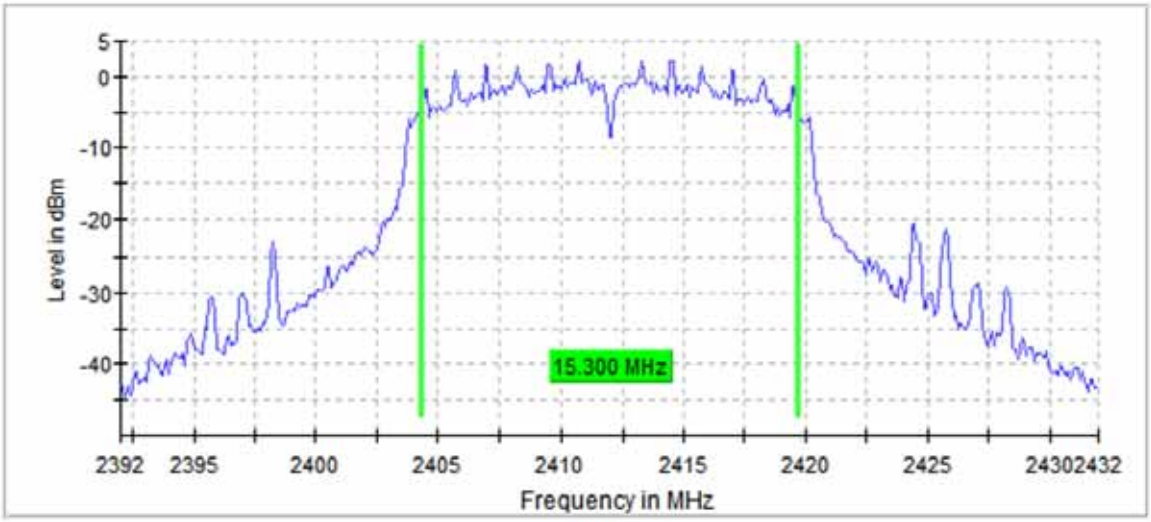
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2462MHz, 802.11b, 11Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2462	10.300000	0.500000	2456.850000	2467.150000	Pass



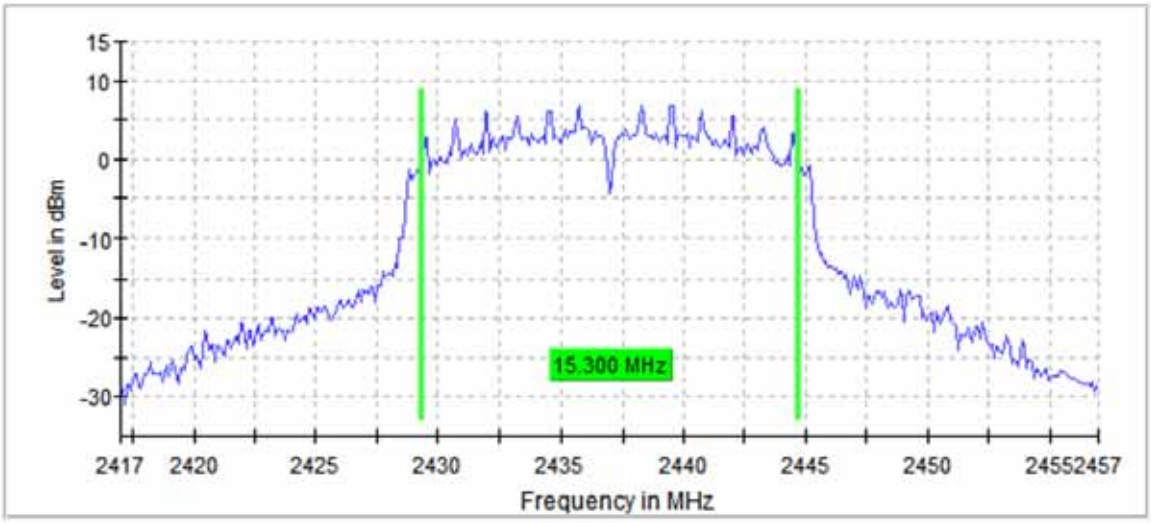
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2412MHz, 802.11g, 6Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2412	15.300000	0.500000	2404.350000	2419.650000	Pass



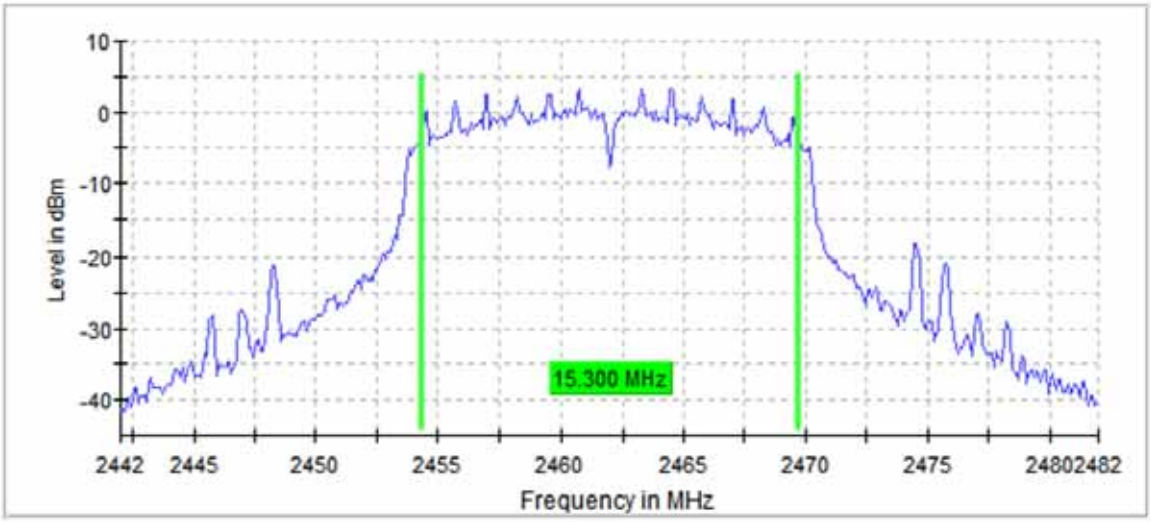
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2437MHz, 802.11g, 6Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437	15.300000	0.500000	2429.350000	2444.650000	Pass



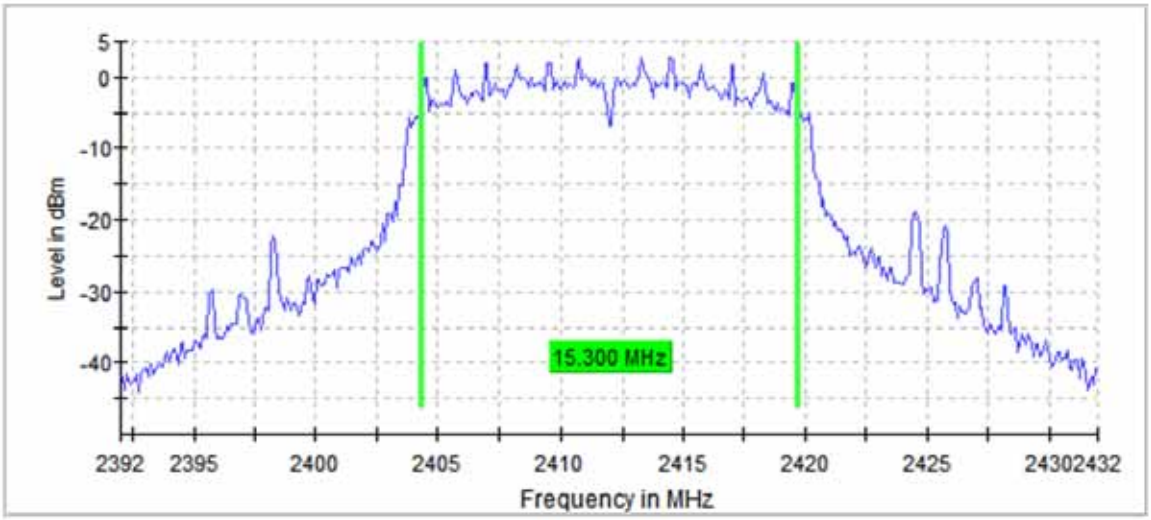
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2462MHz, 802.11g, 6Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2462	15.300000	0.500000	2454.350000	2469.650000	Pass



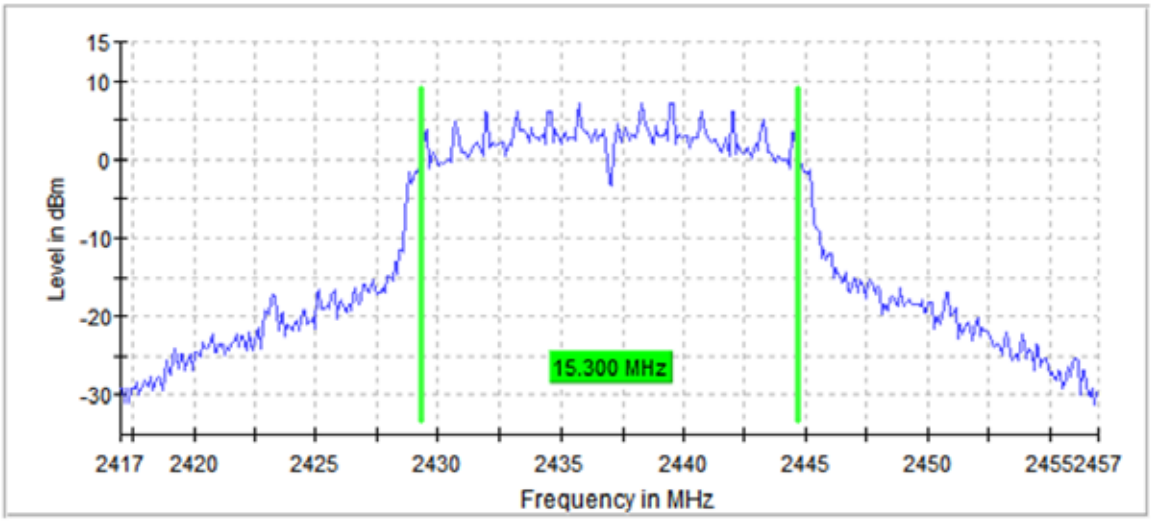
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2412MHz, 802.11g, 9Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2412	15.300000	0.500000	2404.350000	2419.650000	Pass



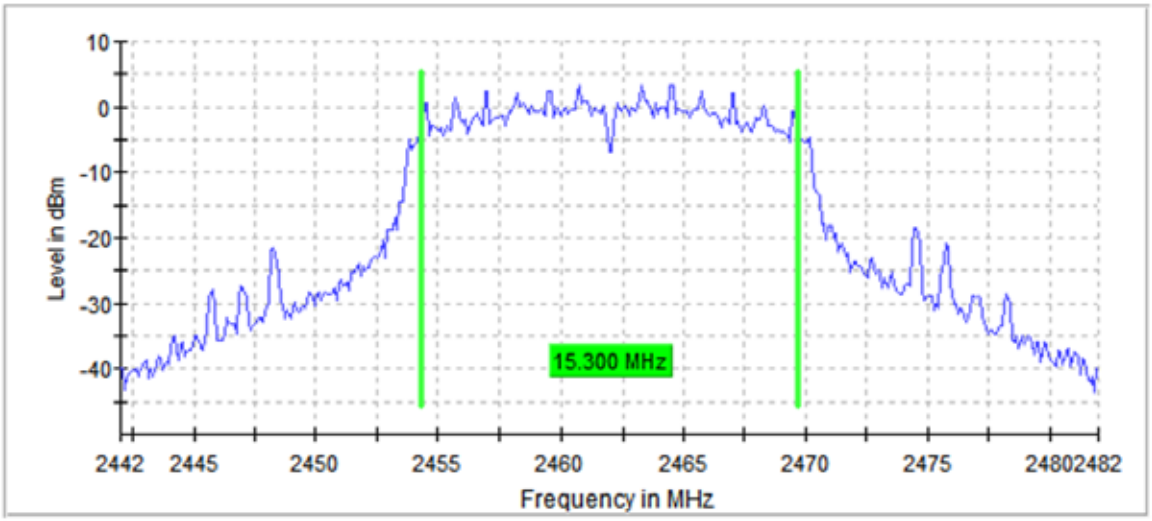
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2437MHz, 802.11g, 9Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437	15.300000	0.500000	2429.350000	2444.650000	Pass



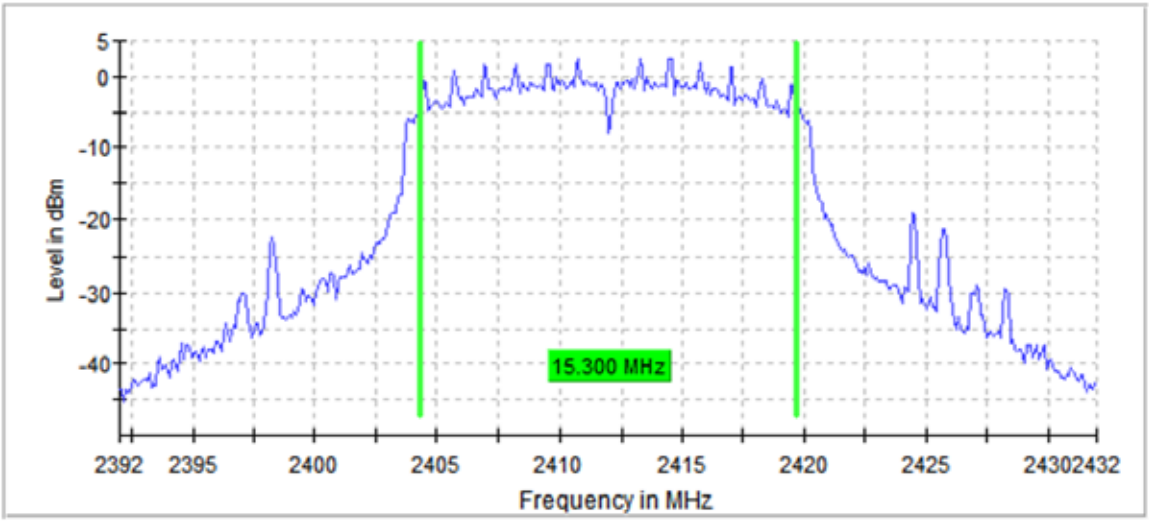
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2462MHz, 802.11g, 9Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2462	15.300000	0.500000	2454.350000	2469.650000	Pass



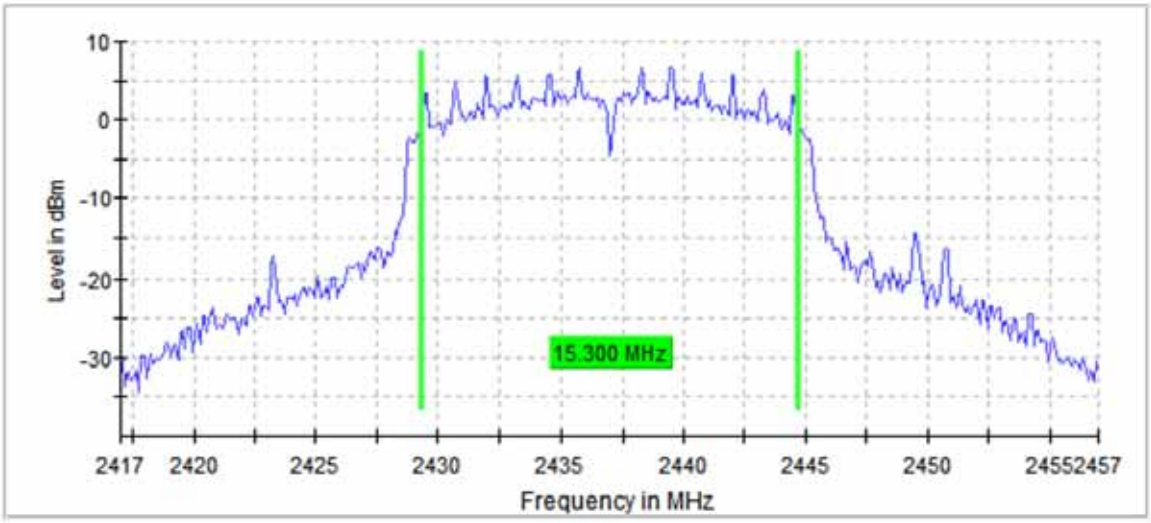
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2412MHz, 802.11g, 12Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2412	15.300000	0.500000	2404.350000	2419.650000	Pass



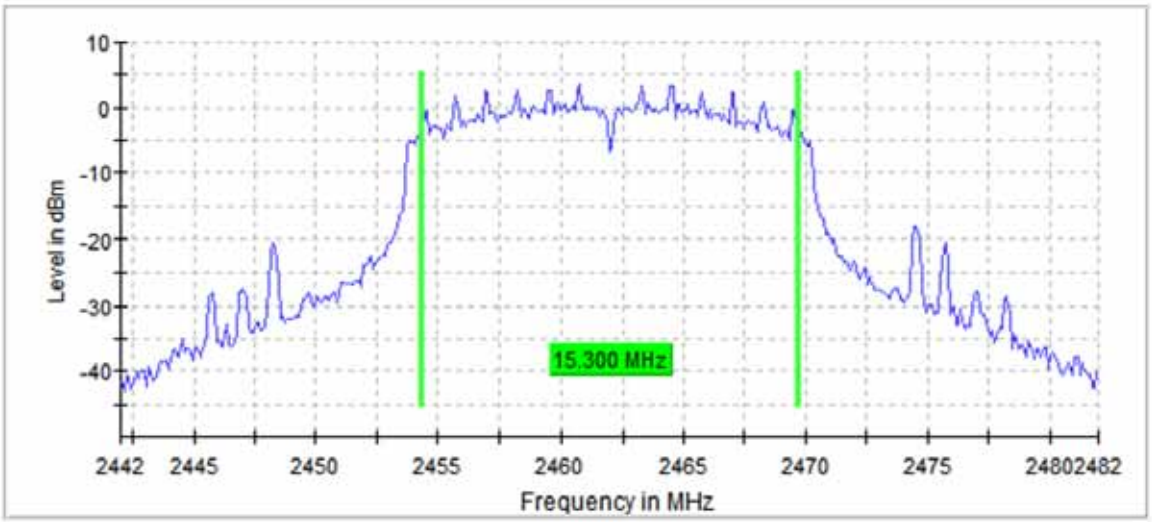
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2437MHz, 802.11g, 12Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437	15.300000	0.500000	2429.350000	2444.650000	Pass



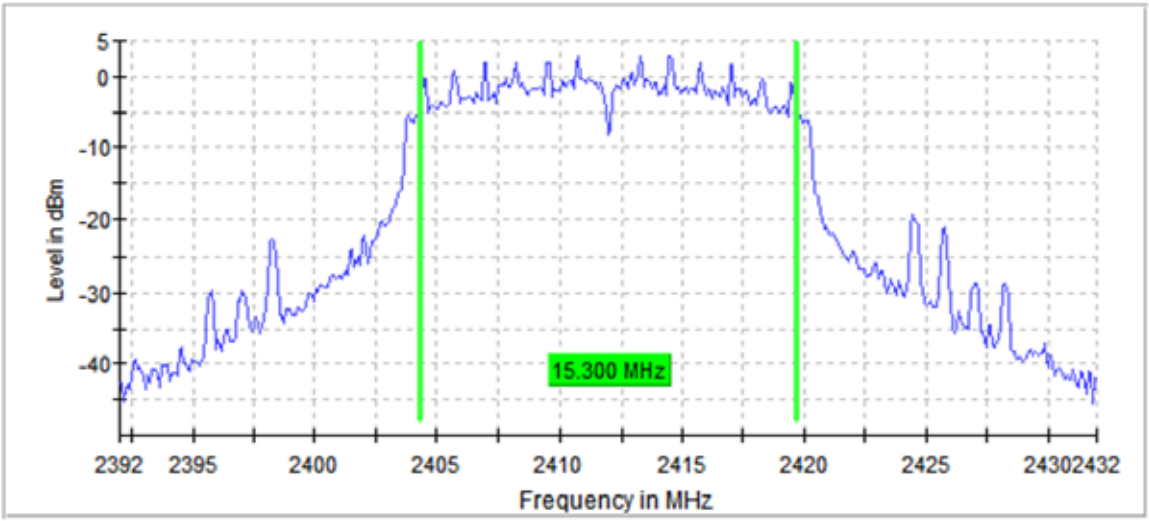
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2462MHz, 802.11g, 12Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2462	15.300000	0.500000	2454.350000	2469.650000	Pass



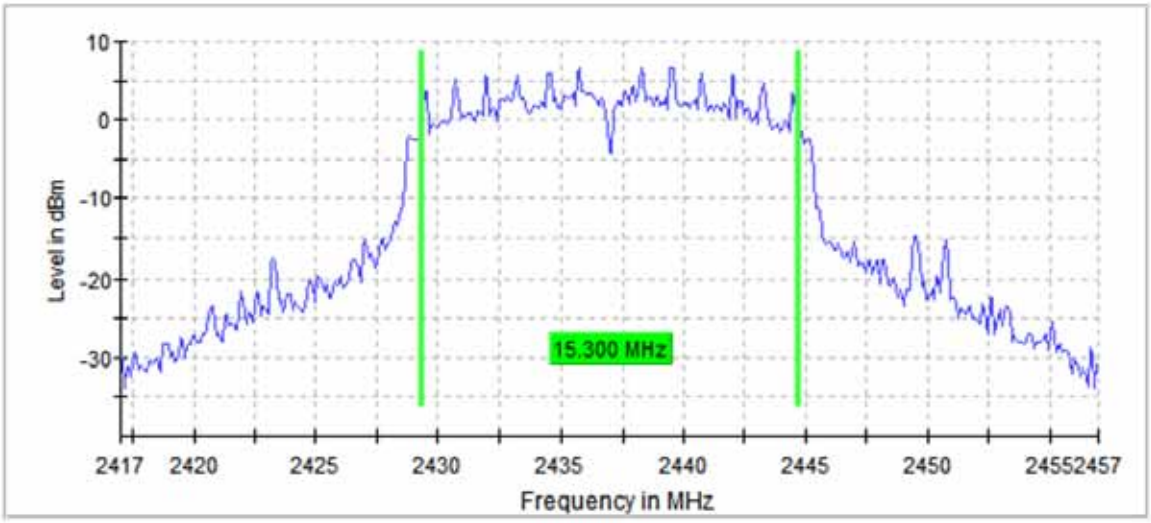
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2412MHz, 802.11g, 18Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2412	15.300000	0.500000	2404.350000	2419.650000	Pass



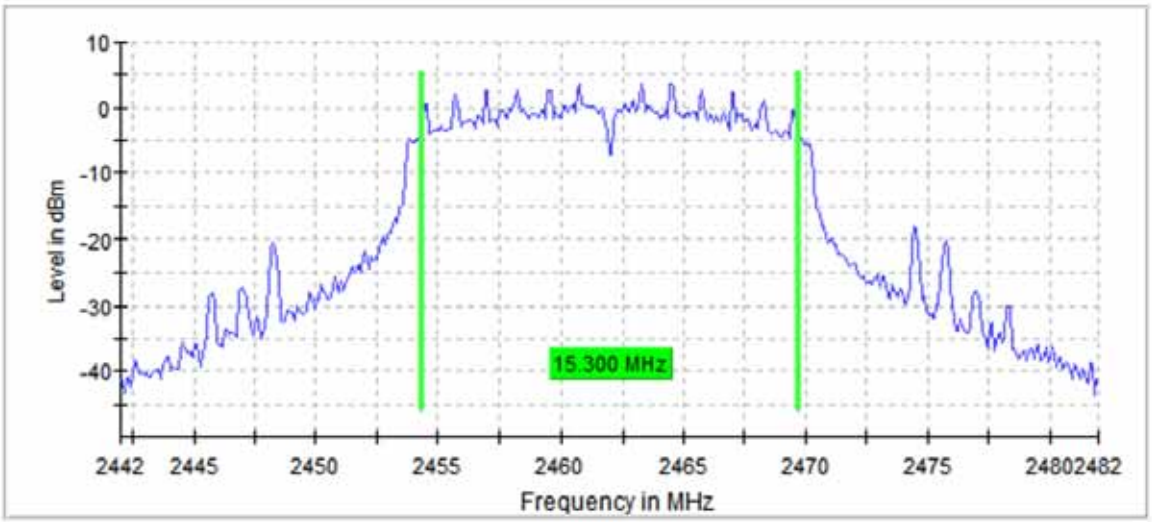
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2437MHz, 802.11g, 18Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437	15.300000	0.500000	2429.350000	2444.650000	Pass



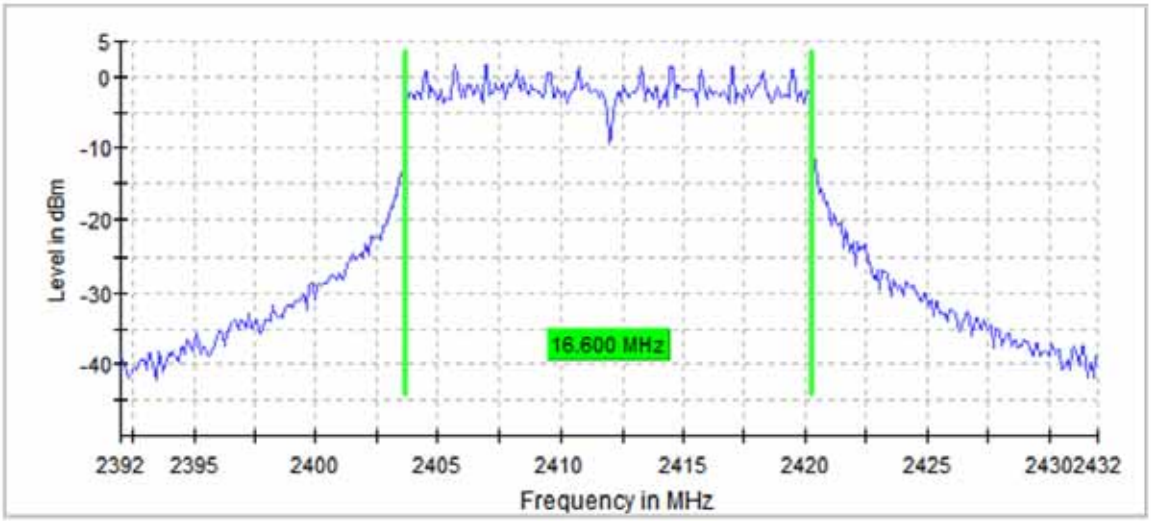
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2462MHz, 802.11g, 18Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2462	15.300000	0.500000	2454.350000	2469.650000	Pass



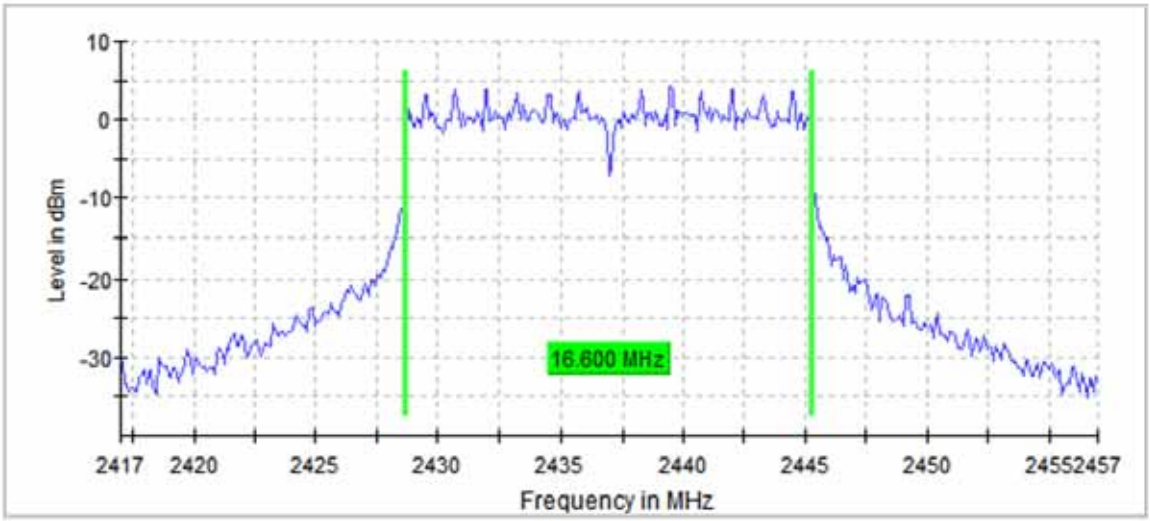
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2412MHz, 802.11g, 24Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2412	16.600000	0.500000	2403.650000	2420.250000	Pass



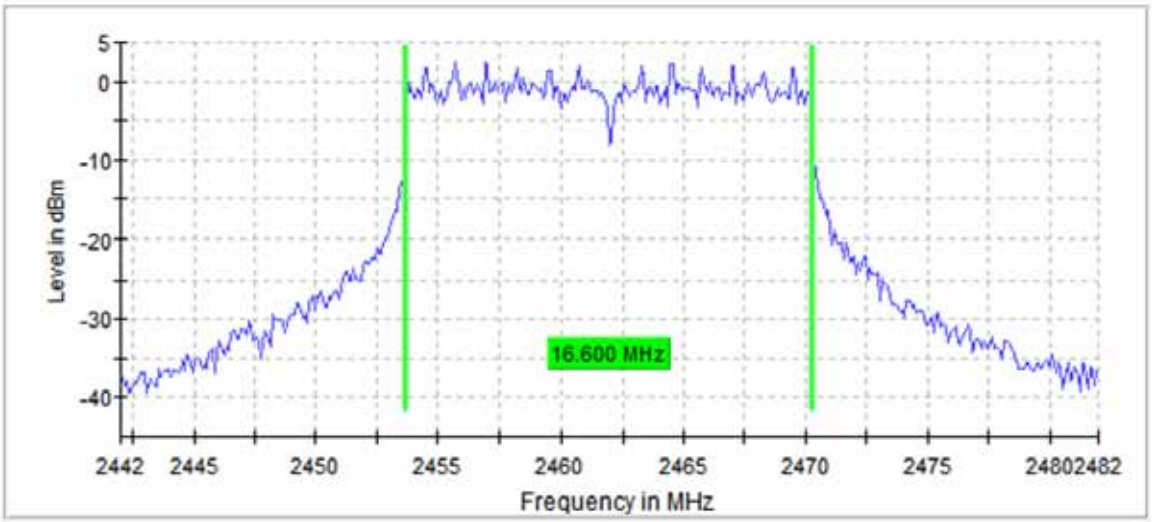
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2437MHz, 802.11g, 24Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437	16.600000	0.500000	2428.650000	2445.250000	Pass



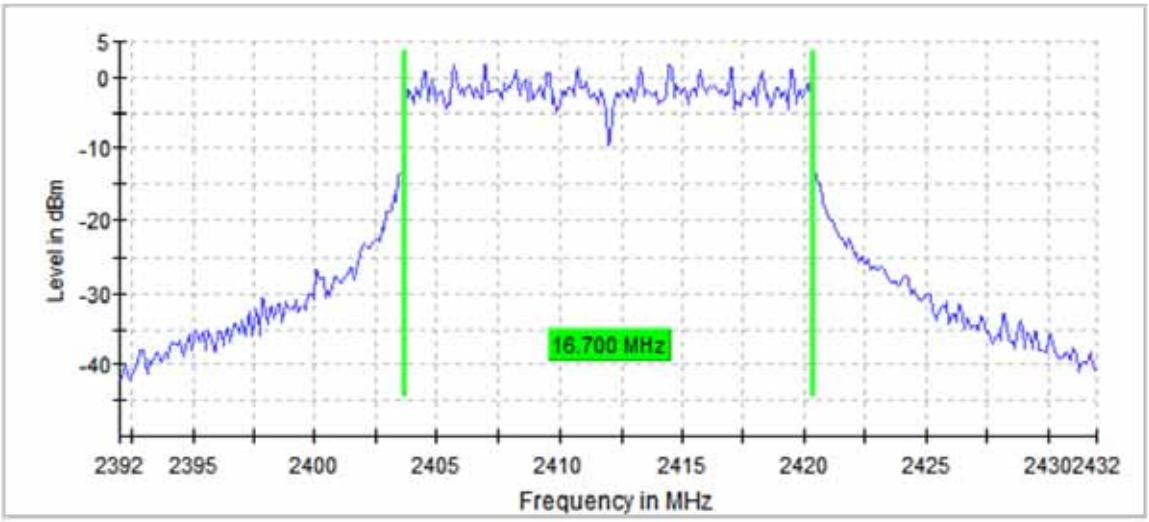
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2462MHz, 802.11g, 24Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2462	16.600000	0.500000	2453.650000	2470.250000	Pass



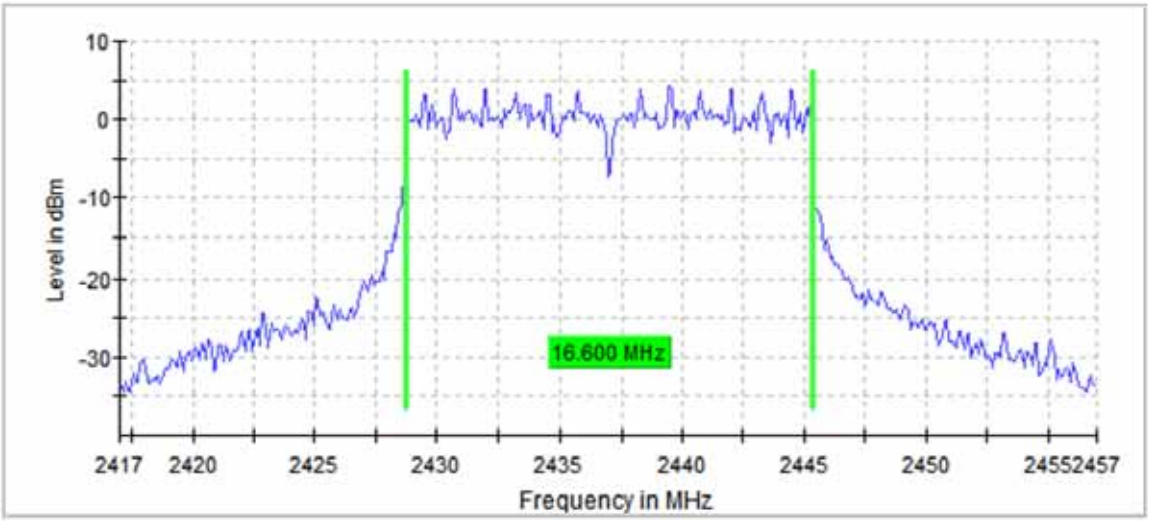
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2412MHz, 802.11g, 36Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2412	16.700000	0.500000	2403.650000	2420.350000	Pass



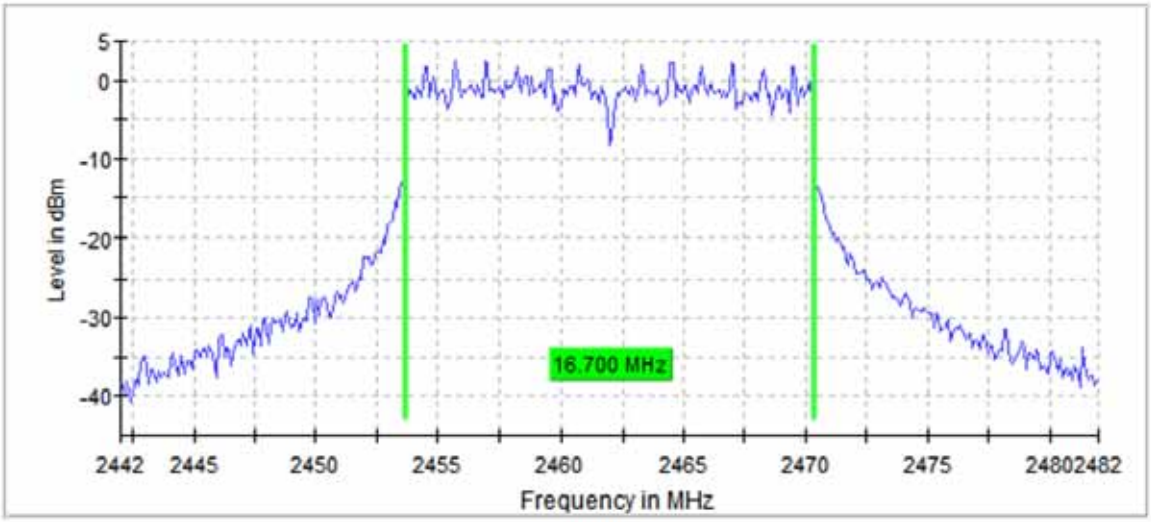
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2437MHz, 802.11g, 36Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437	16.600000	0.500000	2428.750000	2445.350000	Pass



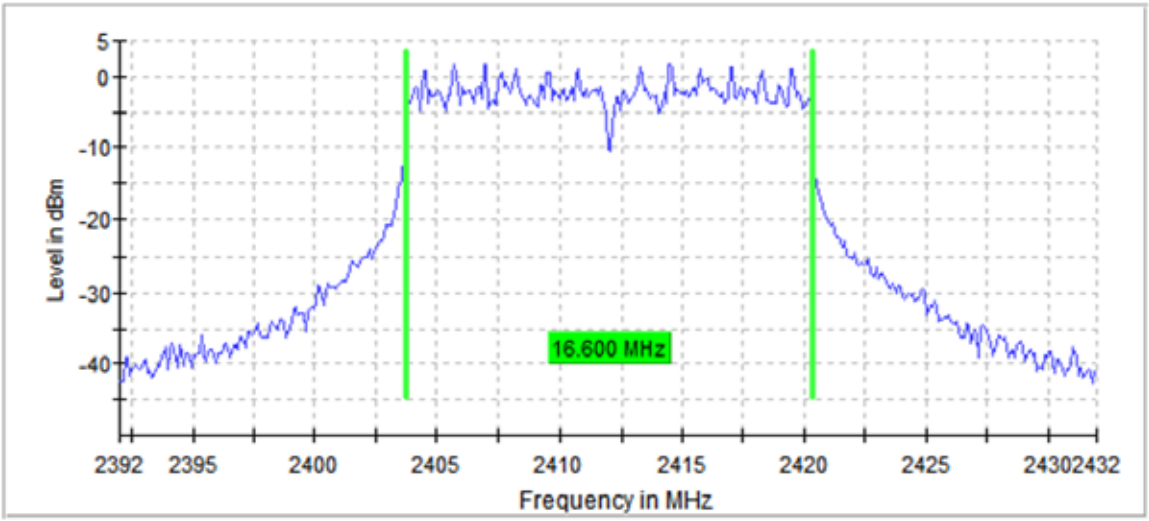
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2462MHz, 802.11g, 36Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2462	16.700000	0.500000	2453.65	2470.35	Pass



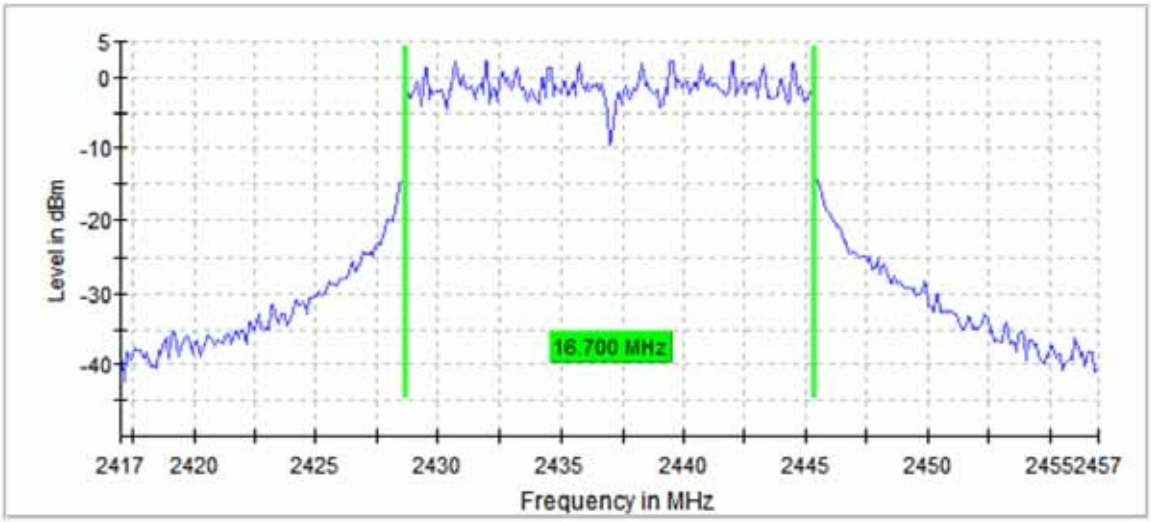
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2412MHz, 802.11g, 48Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2412	16.600000	0.500000	2403.750000	2420.350000	Pass



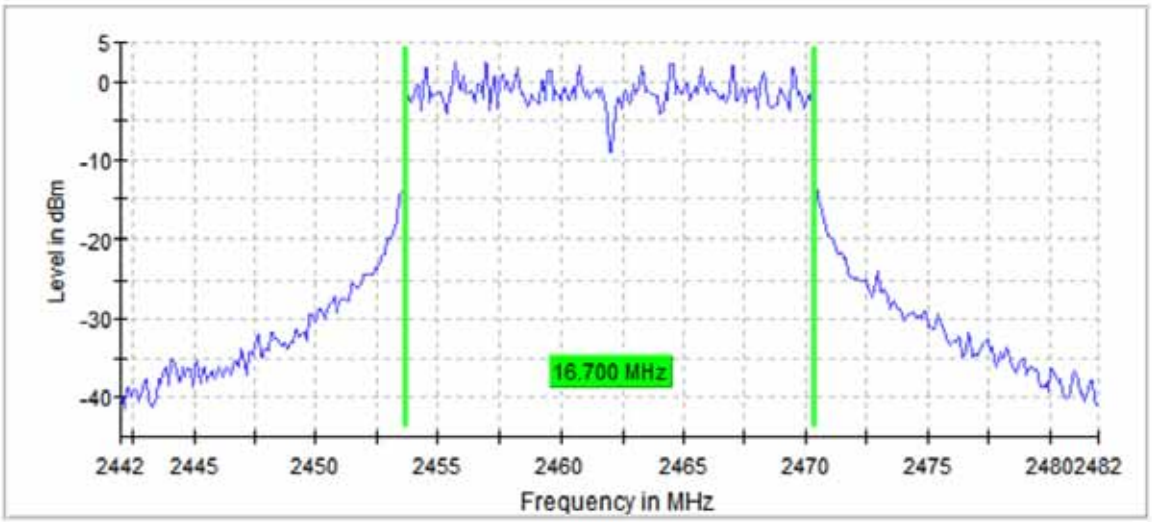
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2437MHz, 802.11g, 48Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437	16.700000	0.500000	2428.650000	2445.350000	Pass



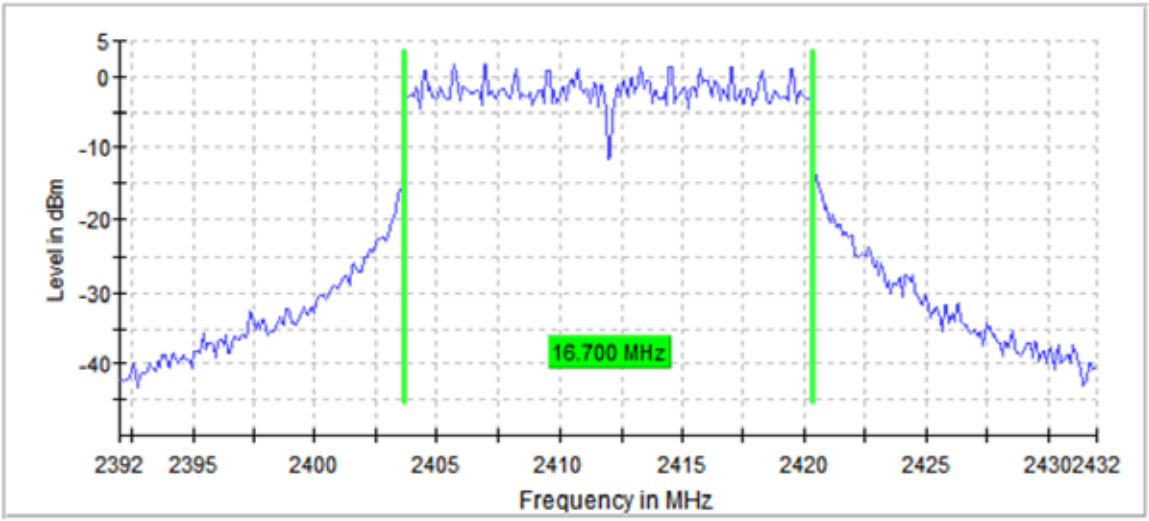
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2462MHz, 802.11g, 48Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2462	16.700000	0.500000	2453.650000	2470.350000	Pass



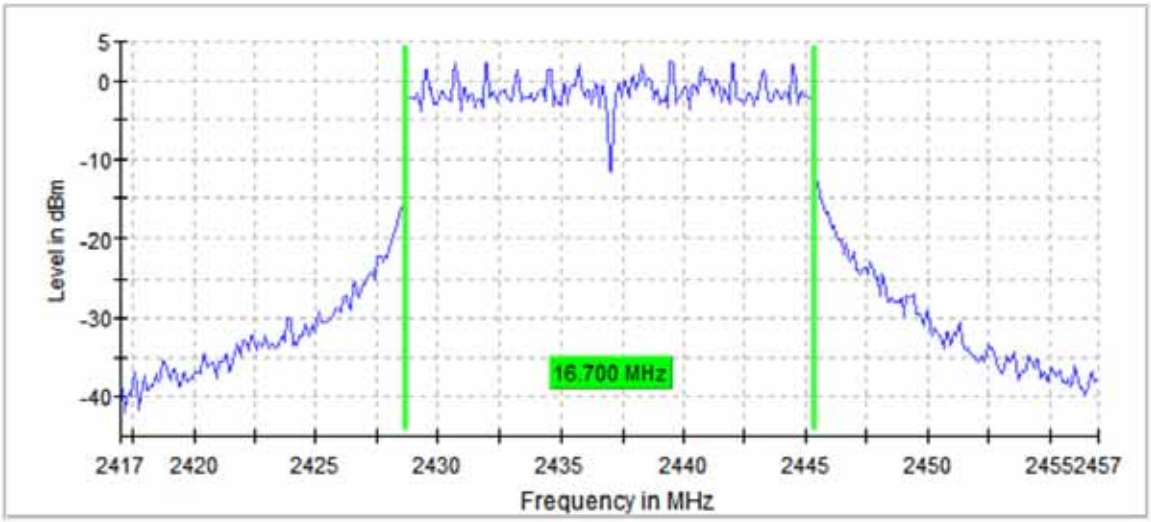
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2412MHz, 802.11g, 54Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2412	16.700000	0.500000	2403.650000	2420.350000	Pass



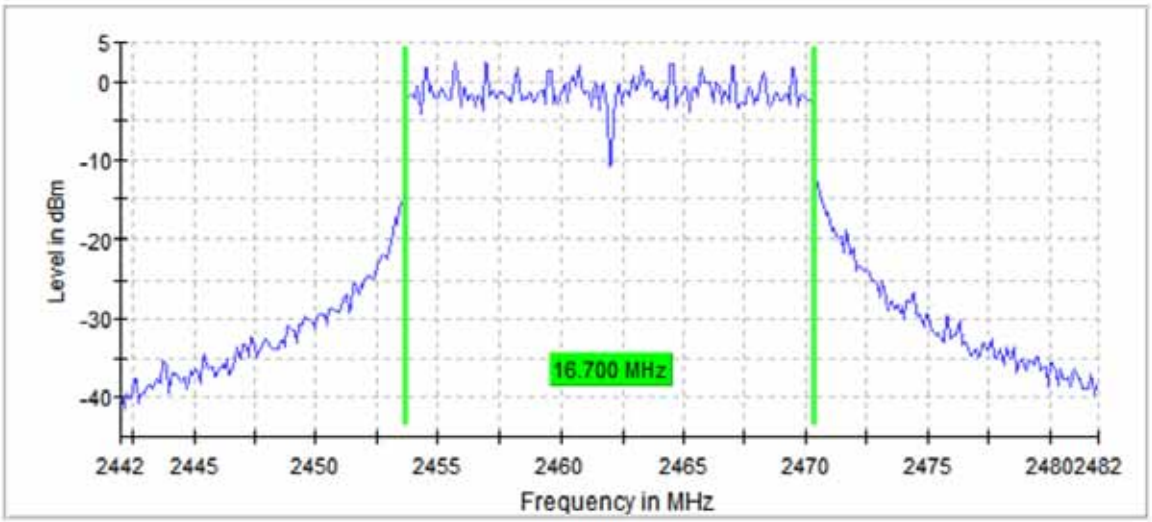
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2437MHz, 802.11g, 54Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437	16.700000	0.500000	2428.650000	2445.350000	Pass



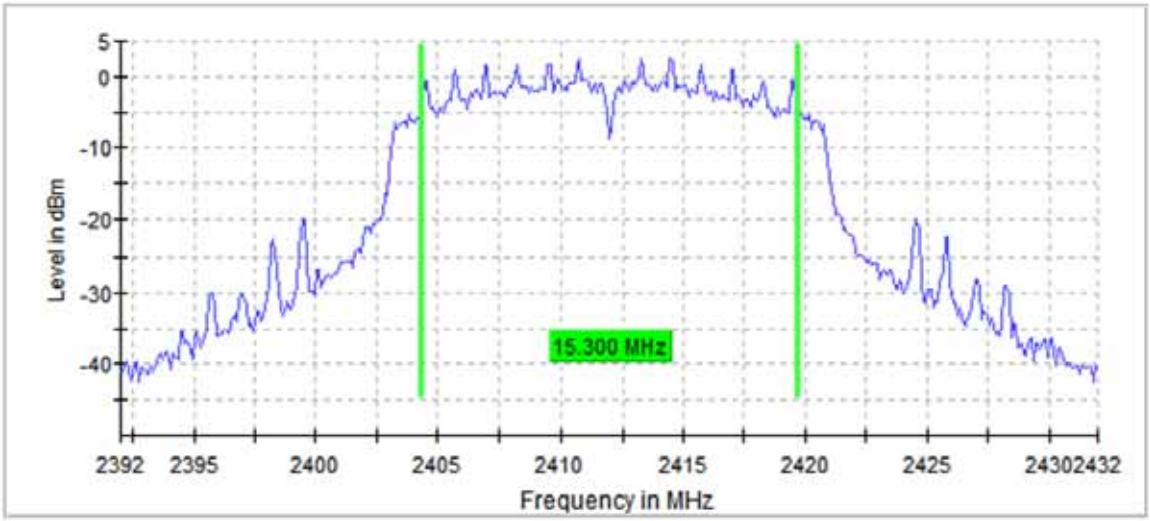
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2462MHz, 802.11g, 54Mbps, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2462	16.700000	0.500000	2453.650000	2470.350000	Pass



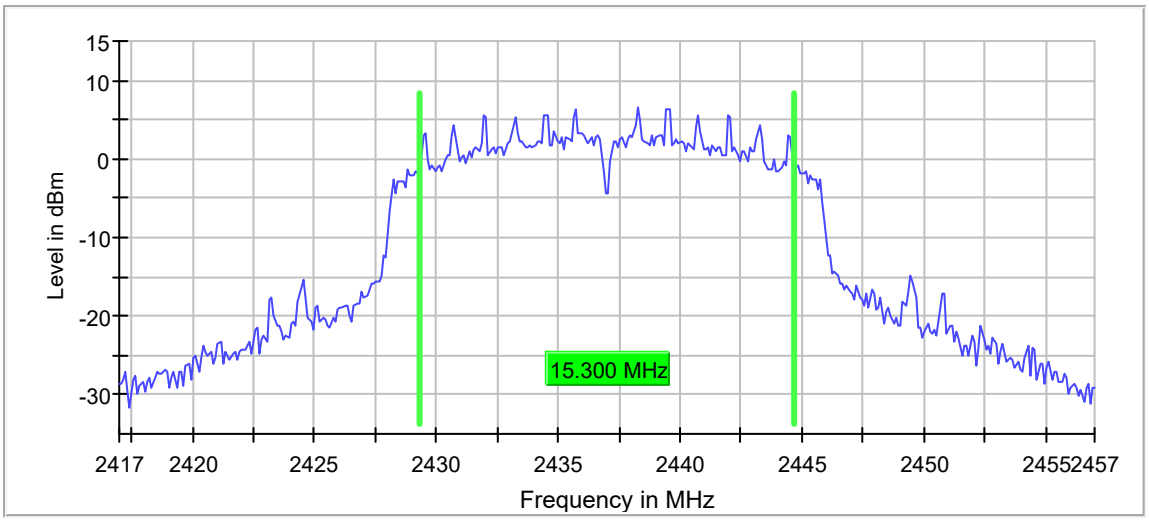
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2412MHz, 802.11n, MCS0, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2412	15.300000	0.500000	2404.350000	2419.650000	Pass



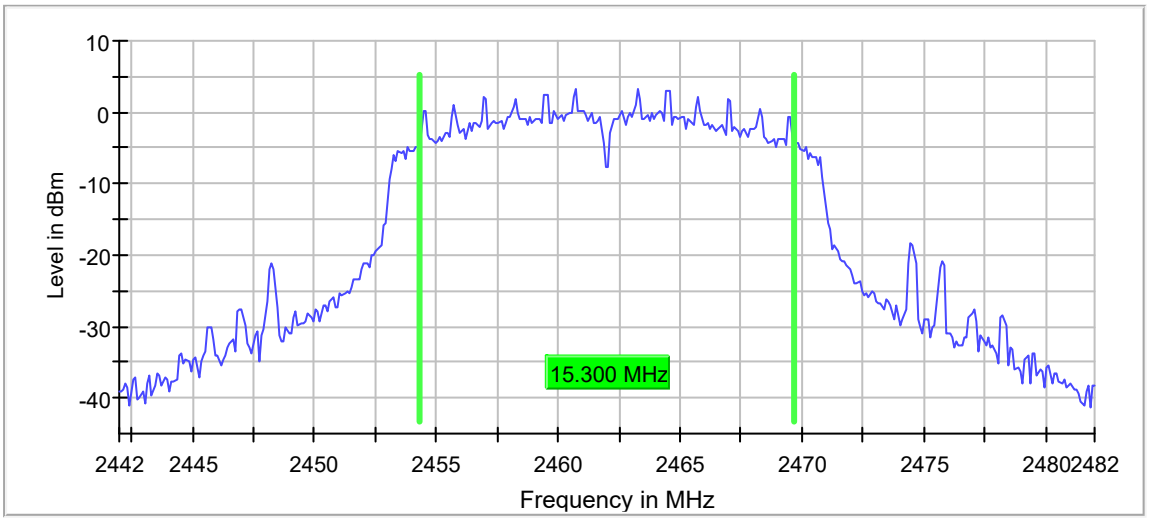
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2437MHz, 802.11n, MCS0, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437	15.300000	0.500000	2429.350000	2444.650000	Pass



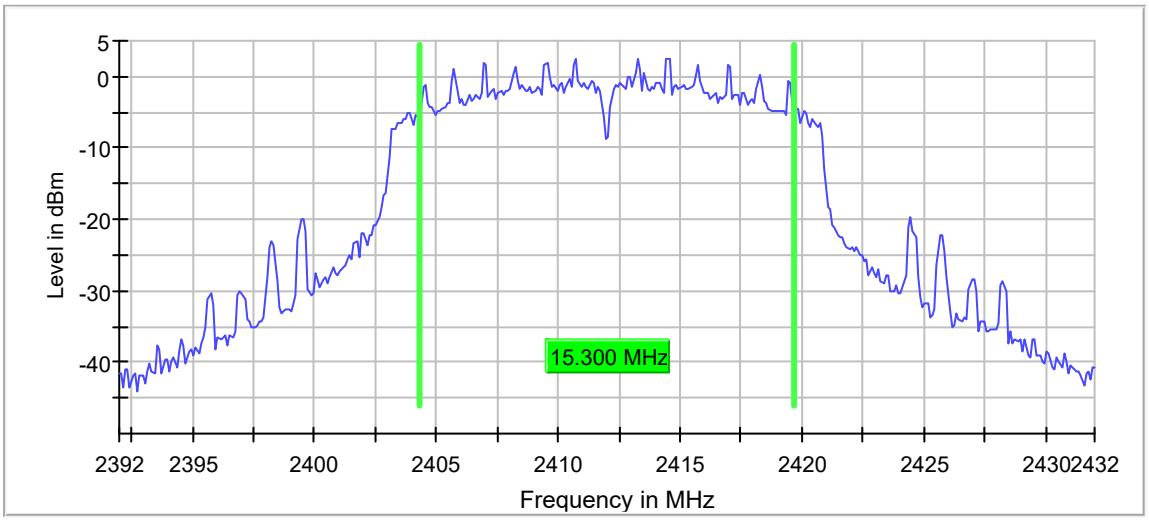
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2462MHz, 802.11n, MCS0, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2462	15.300000	0.500000	2453.350000	2469.650000	Pass



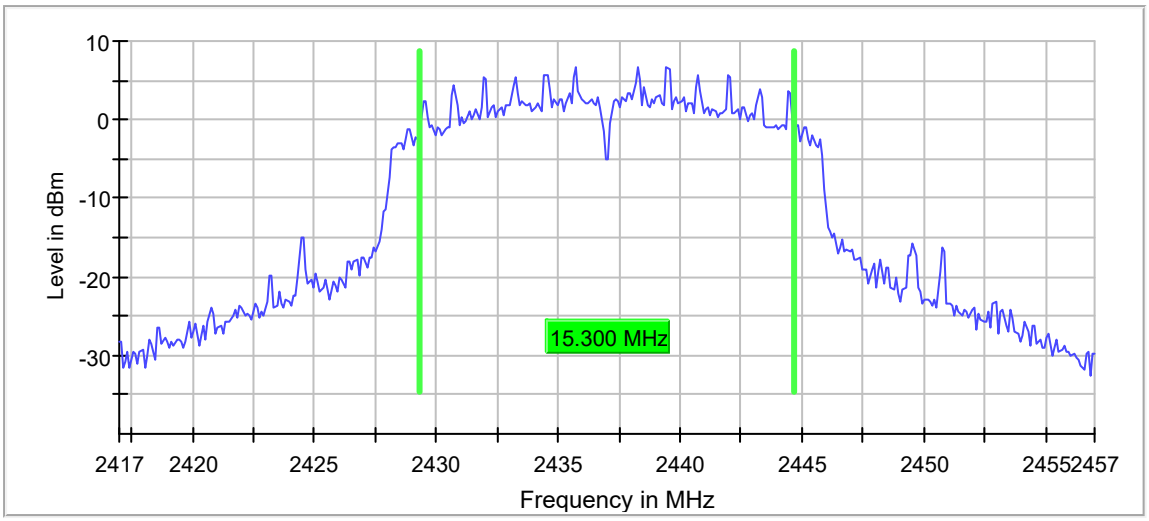
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2412MHz, 802.11n, MCS1, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2412	15.300000	0.500000	2404.350000	2419.650000	Pass



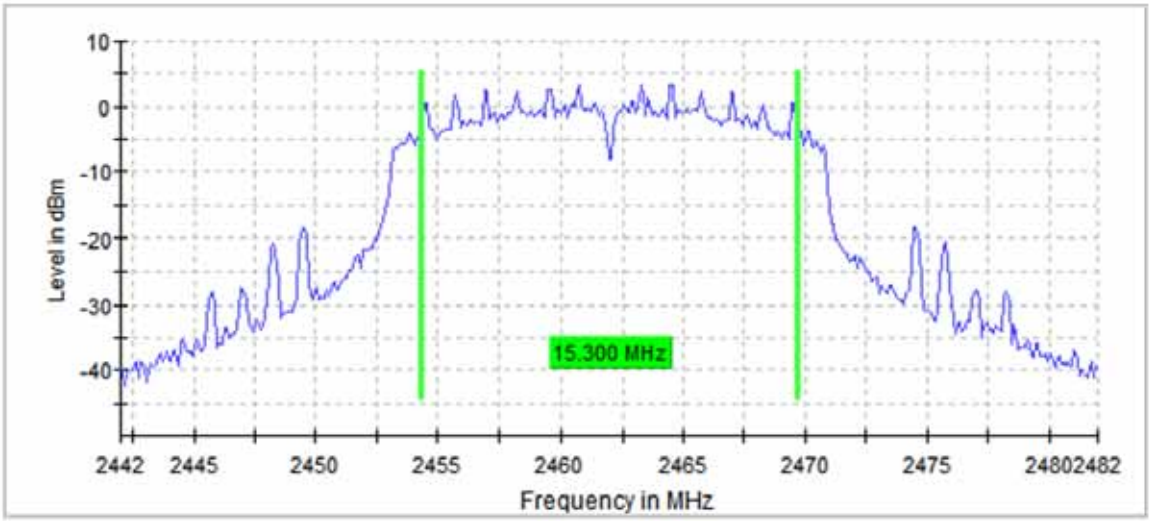
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2437MHz, 802.11n, MCS1, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437	15.300000	0.500000	2429.350000	2444.650000	Pass



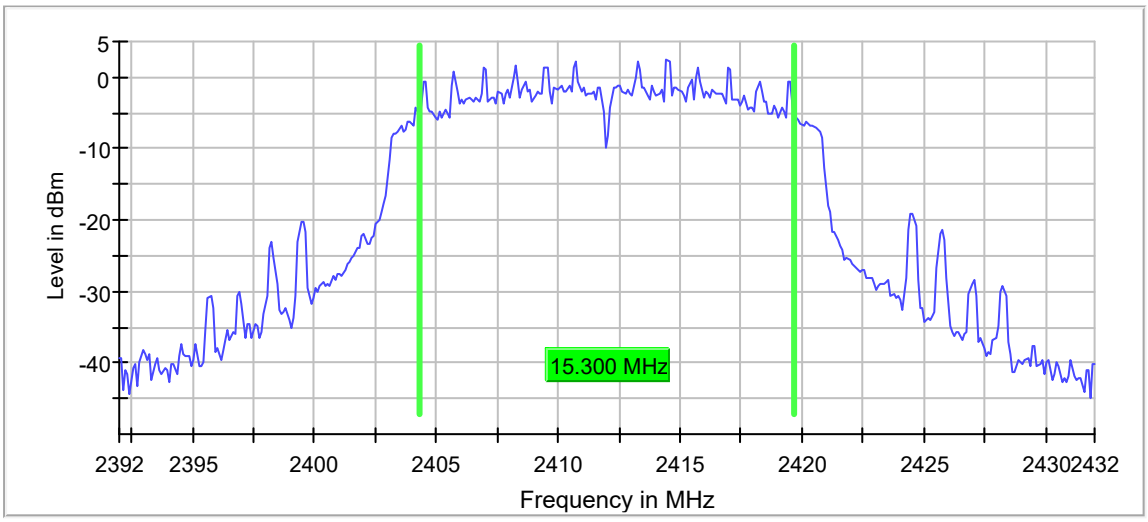
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2462MHz, 802.11n, MCS1, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2462	15.300000	0.500000	2454.350000	2469.650000	Pass



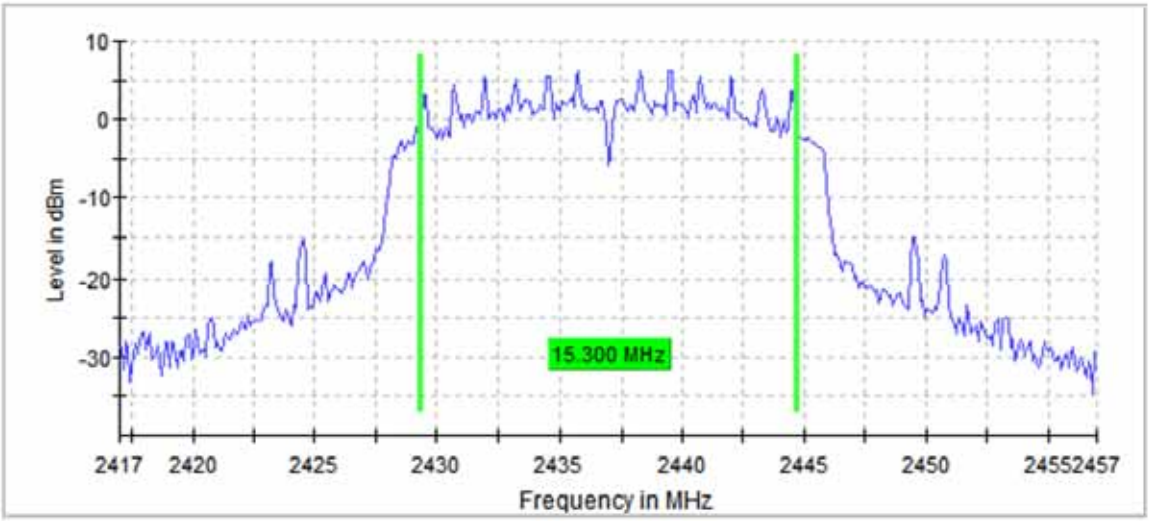
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2412MHz, 802.11n, MCS2, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2412	15.300000	0.500000	2404.350000	2419.650000	Pass



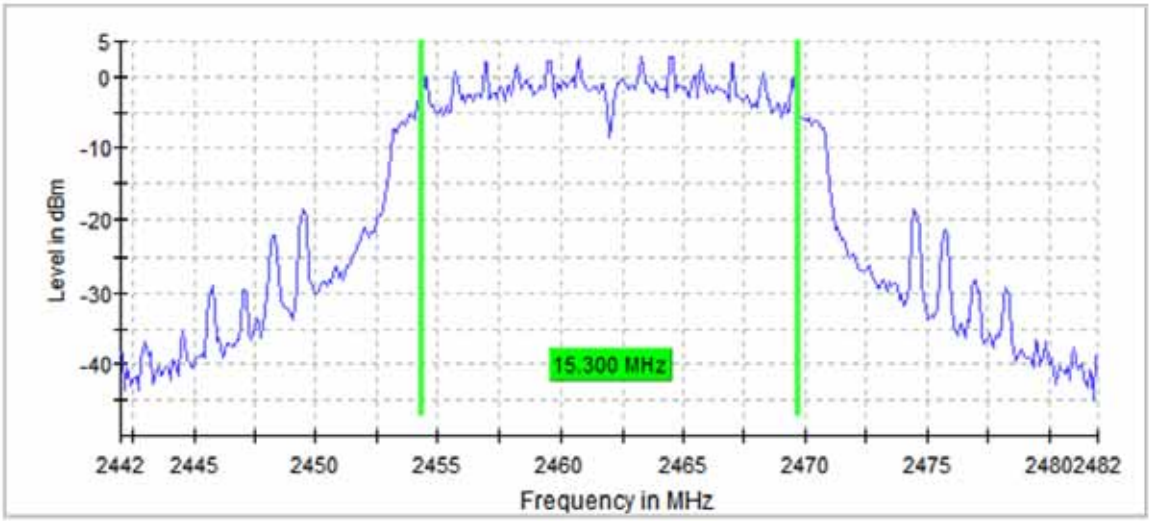
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2437MHz, 802.11n, MCS2, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437	15.300000	0.500000	2429.350000	2444.650000	Pass



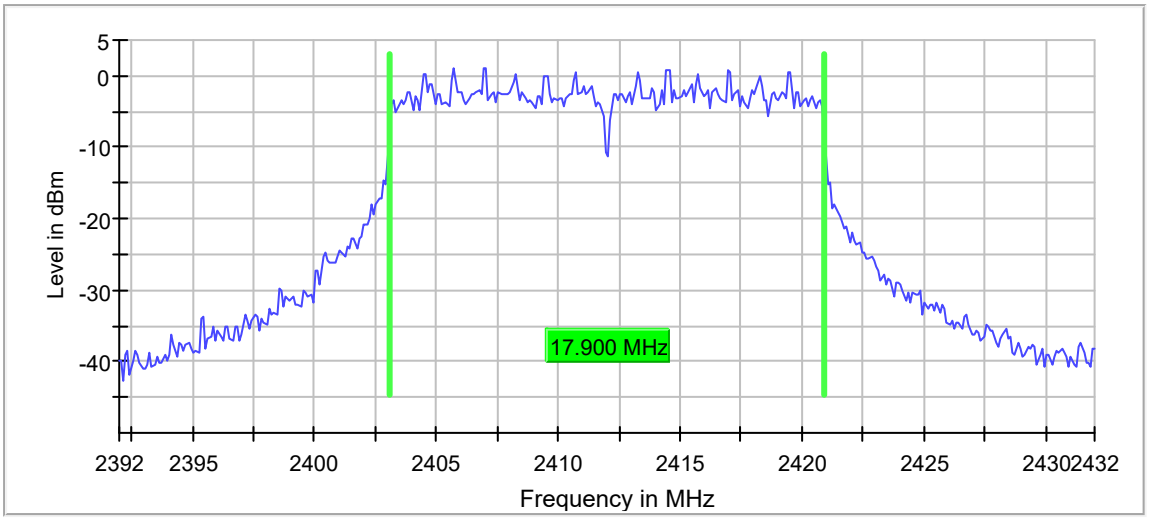
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2462MHz, 802.11n, MCS2, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2462	15.300000	0.500000	2454.350000	2469.650000	Pass



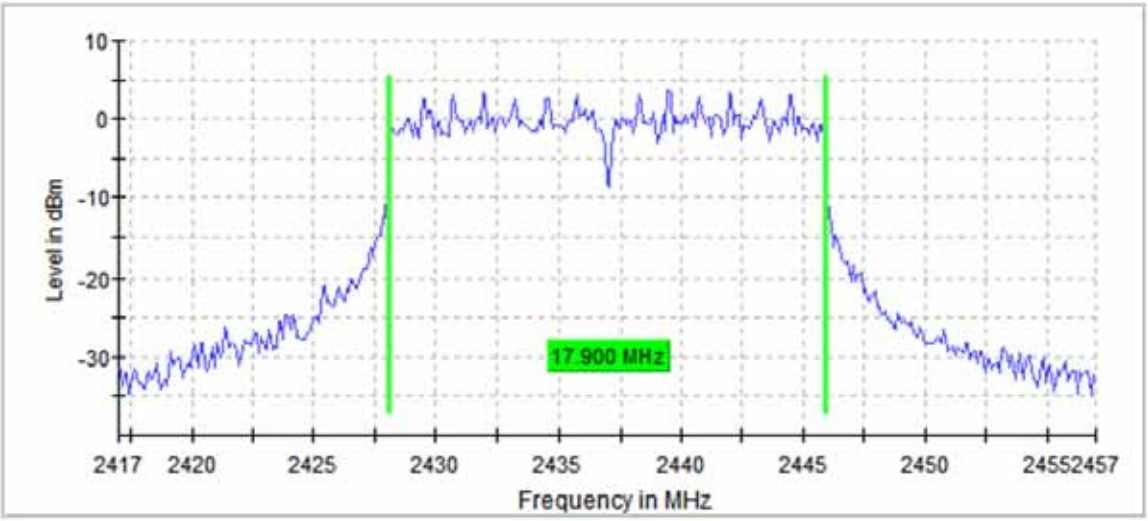
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2412MHz, 802.11n, MCS3, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2412	17.900000	0.500000	2403.050000	2420.950000	Pass



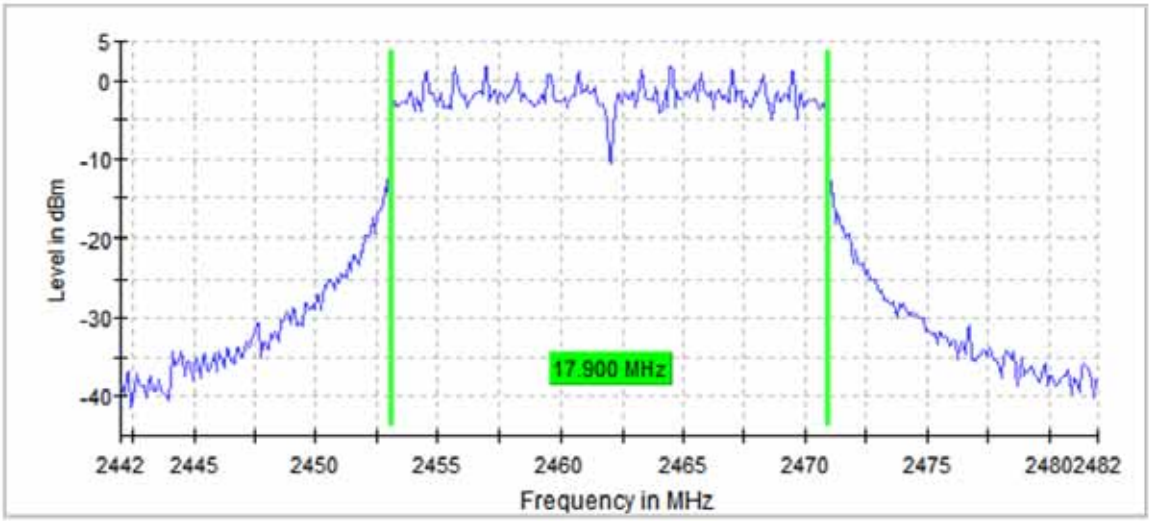
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2437MHz, 802.11n, MCS3, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437	17.900000	0.500000	2428.050000	2445.950000	Pass



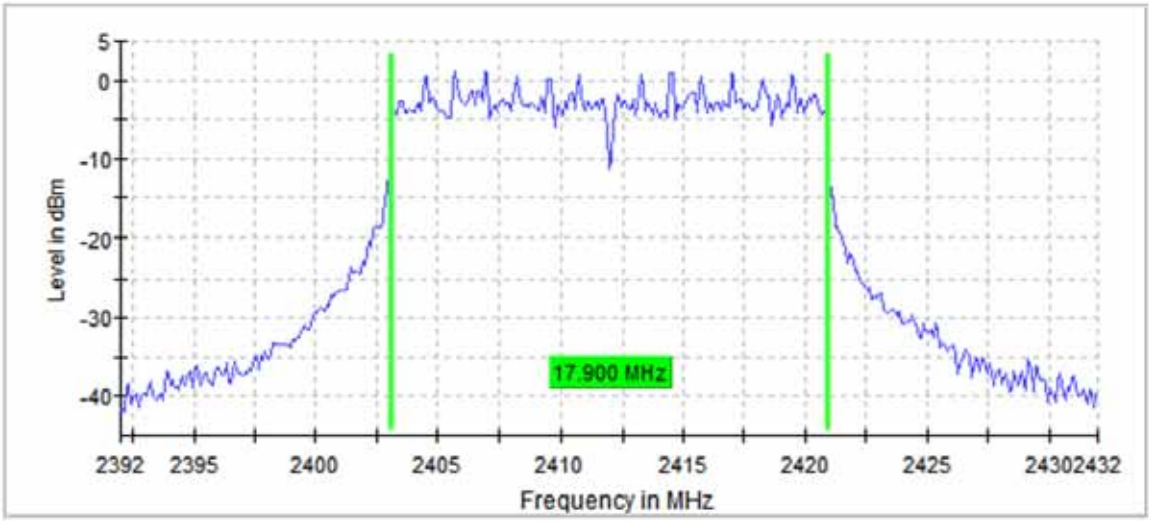
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2462MHz, 802.11n, MCS3, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2462	17.900000	0.500000	2453.050000	2470.950000	Pass



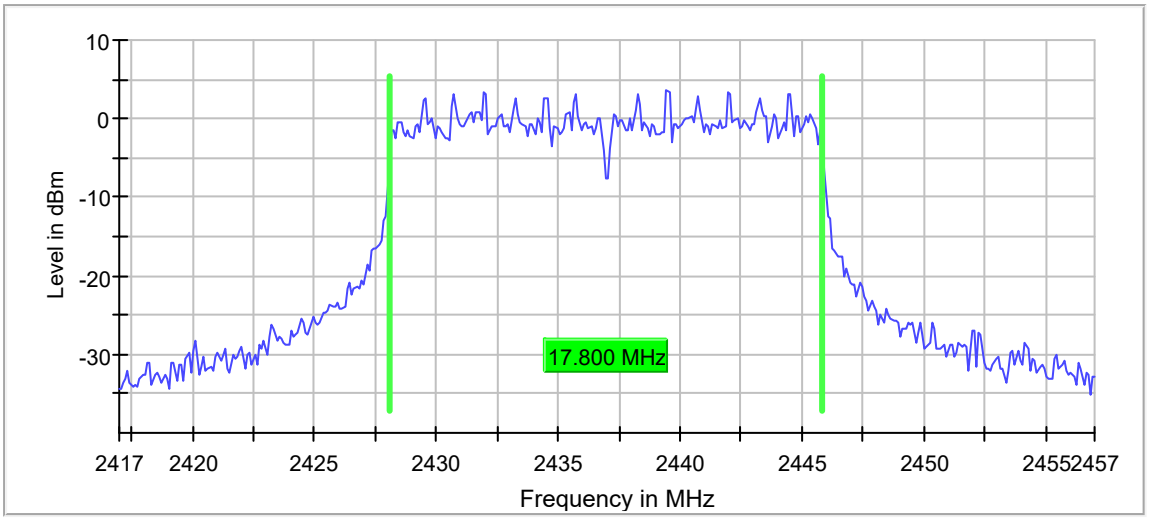
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2412MHz, 802.11n, MCS4, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2412	17.900000	0.500000	2403.050000	2420.950000	Pass



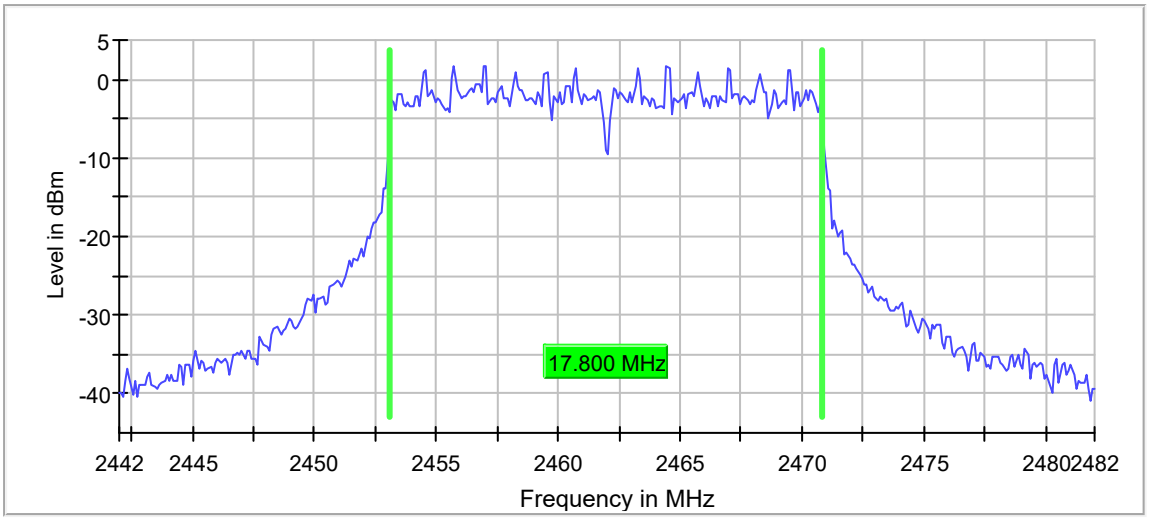
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2437MHz, 802.11n, MCS4, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437	17.800000	0.500000	2428.050000	2445.550000	Pass



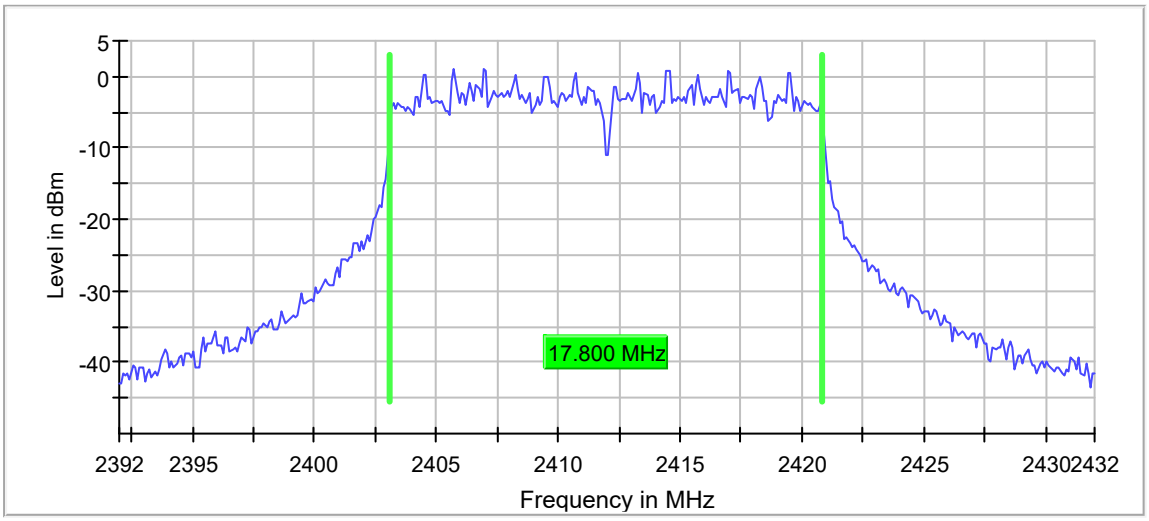
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2462MHz, 802.11n, MCS4, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2462	17.800000	0.500000	2453.050000	2470.850000	Pass



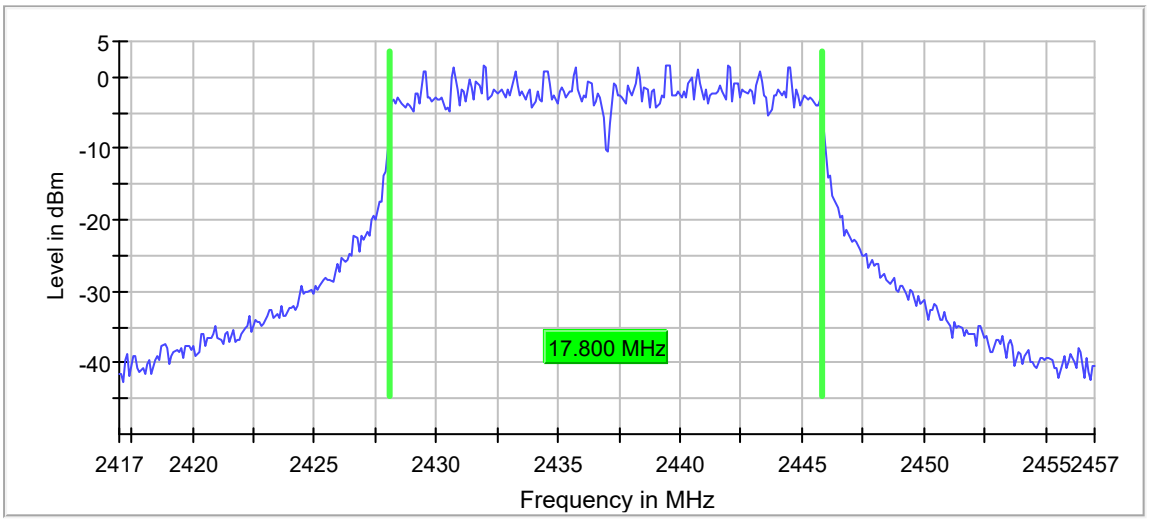
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2412MHz, 802.11n, MCS5, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2412	17.800000	0.500000	2403.050000	2420.850000	Pass



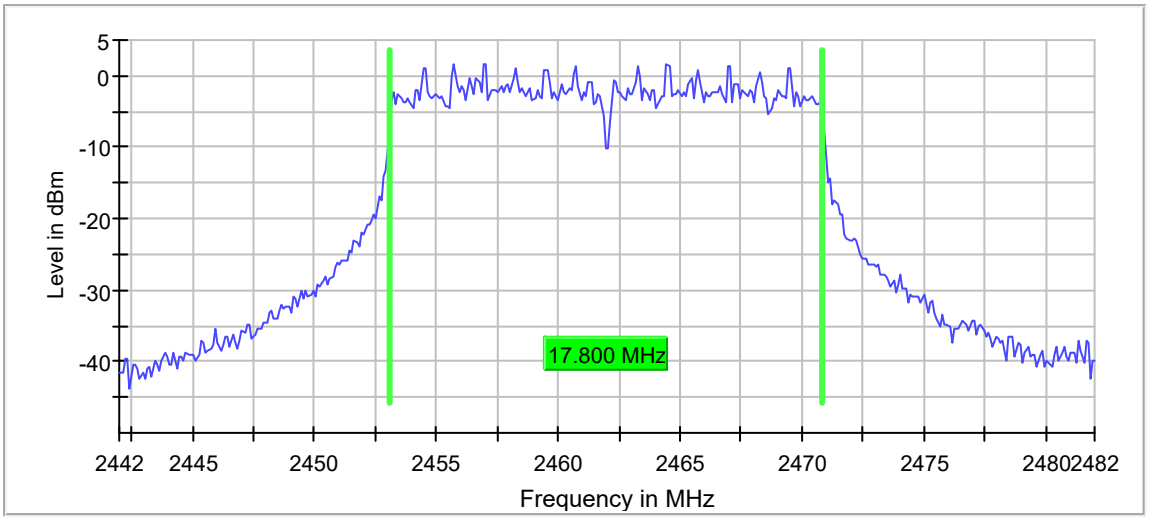
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2437MHz, 802.11n, MCS5, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437	17.800000	0.500000	2428.050000	2445.550000	Pass



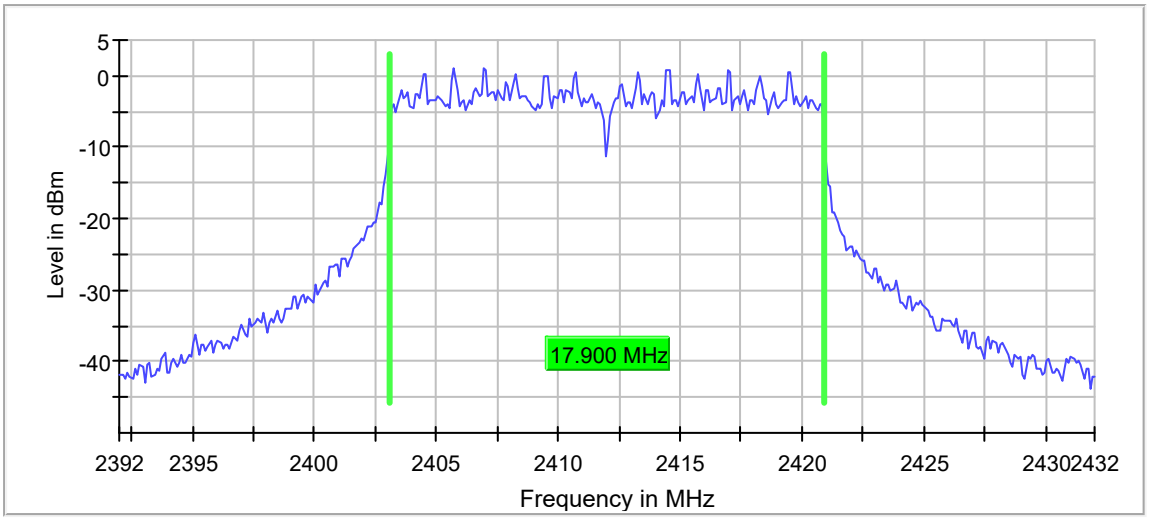
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2462MHz, 802.11n, MCS5, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2462	17.800000	0.500000	2453.050000	2470.850000	Pass



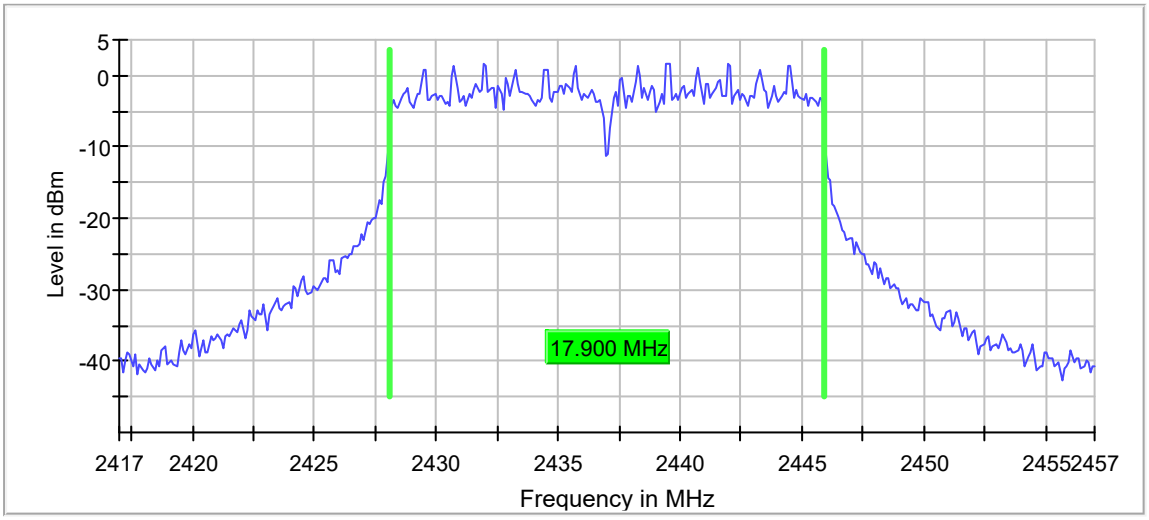
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2412MHz, 802.11n, MCS6, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2412	17.900000	0.500000	2403.050000	2420.950000	Pass



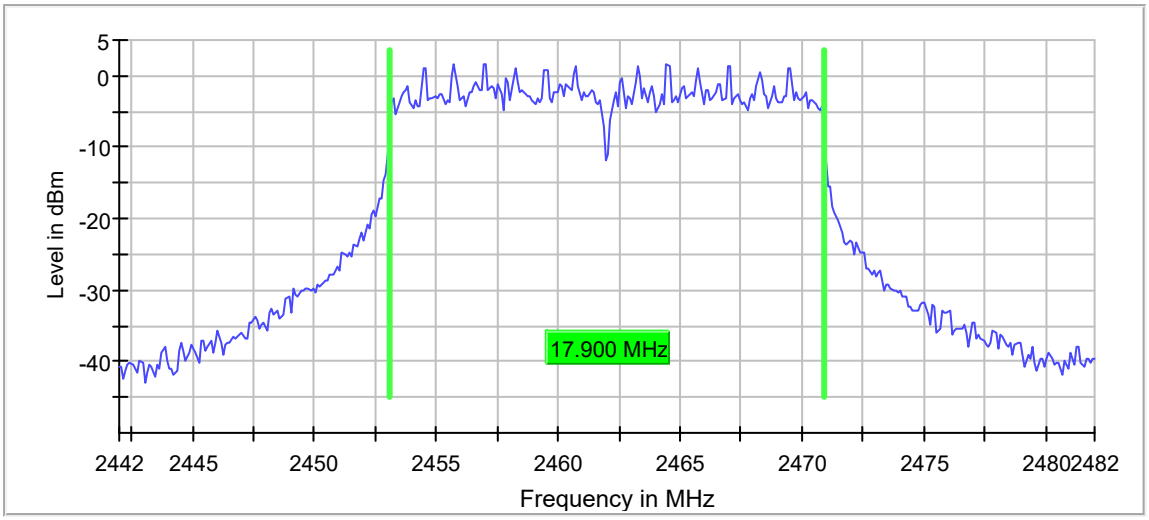
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2437MHz, 802.11n, MCS6, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437	17.900000	0.500000	2428.050000	2445.950000	Pass



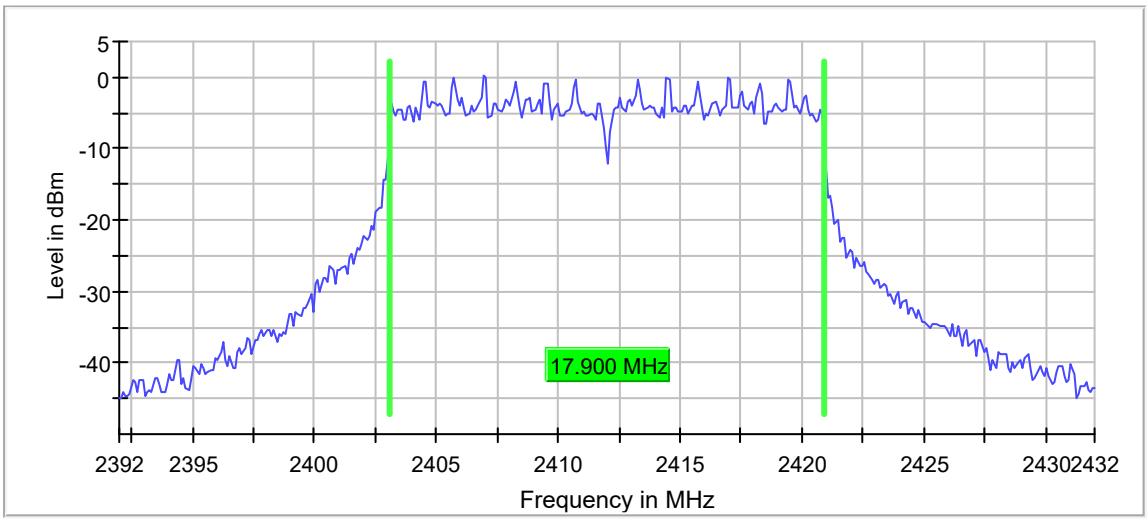
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2462MHz, 802.11n, MCS6, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2462	17.900000	0.500000	2453.050000	2470.950000	Pass



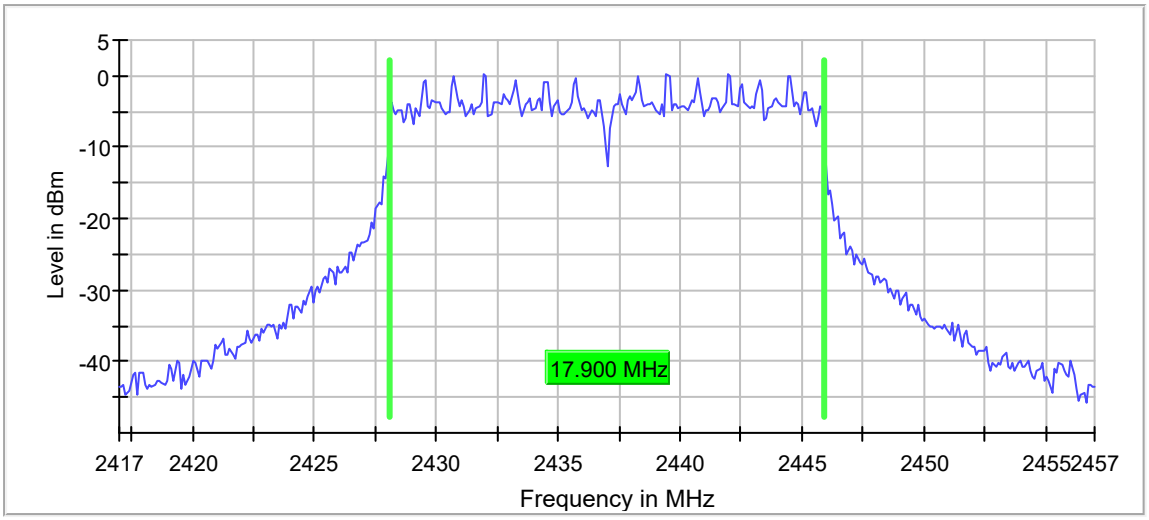
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2412MHz, 802.11n, MCS7, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2412	17.900000	0.500000	2403.050000	2420.950000	Pass



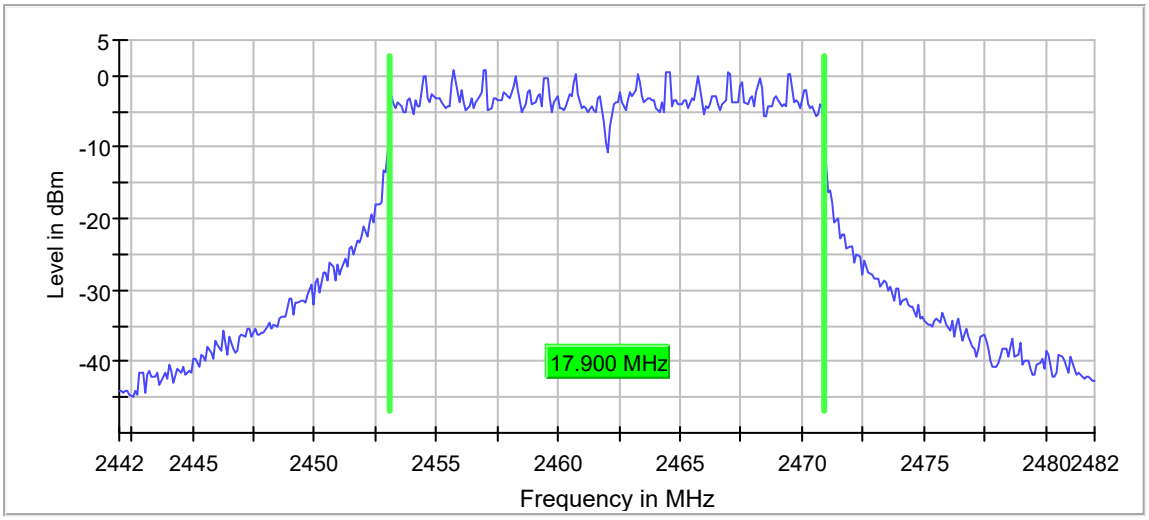
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2437MHz, 802.11n, MCS7, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2437	17.900000	0.500000	2428.050000	2445.950000	Pass



Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : Transmit at 2462MHz, 802.11n, MCS7, power setting = 0
Test Performed : 6dB Bandwidth
Test Date : January 14, 2019

DUT Frequency MHz	Bandwidth MHz	Limit Min (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
2462	17.900000	0.500000	2453.050000	2470.950000	Pass



Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : 802.11b, power setting = 0
Test Performed : Peak Output Power (Antenna Conducted)
Test Date : January 14, 2019

Frequency MHz	Data Rate Mbps	Measured Peak Power dBm	Power Limit dBm	Result
2412	1	17.7	30.0	Pass
2437	1	17.9	30.0	Pass
2462	1	18.4	30.0	Pass
2412	2	17.6	30.0	Pass
2437	2	18.0	30.0	Pass
2462	2	18.5	30.0	Pass
2412	5.5	20.2	30.0	Pass
2437	5.5	20.7	30.0	Pass
2462	5.5	21.3	30.0	Pass
2412	5.5	17.7	30.0	Pass
2437	11	18.4	30.0	Pass
2462	11	18.9	30.0	Pass

Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : 802.11g, power setting = 0
Test Performed : Peak Output Power (Antenna Conducted)
Test Date : January 14, 2019

Frequency MHz	Data Rate Mbps	Measured Peak Power dBm	Power Limit dBm	Result
2412	6	20.6	30.0	Pass
2437	6	21.9	30.0	Pass
2462	6	21.1	30.0	Pass
2412	9	20.9	30.0	Pass
2437	9	22.1	30.0	Pass
2462	9	21.2	30.0	Pass
2412	12	21.0	30.0	Pass
2437	12	22.1	30.0	Pass
2462	12	21.5	30.0	Pass
2412	18	20.8	30.0	Pass
2437	18	22.2	30.0	Pass
2462	18	21.3	30.0	Pass
2412	24	21.0	30.0	Pass
2437	24	21.8	30.0	Pass
2462	24	21.6	30.0	Pass
2412	36	21.1	30.0	Pass
2437	36	21.9	30.0	Pass
2462	36	21.6	30.0	Pass
2412	48	21.0	30.0	Pass
2437	48	21.4	30.0	Pass
2462	48	21.3	30.0	Pass
2412	54	20.9	30.0	Pass
2437	54	21.5	30.0	Pass
2462	54	21.4	30.0	Pass

Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : 802.11n, power setting = 0
Test Performed : Peak Output Power (Antenna Conducted)
Test Date : January 14, 2019

Frequency MHz	Data Rate	Measured Peak Power dBm	Power Limit dBm	Result
2412	MCS0	21.3	30.0	Pass
2437	MCS0	22.4	30.0	Pass
2462	MCS0	21.8	30.0	Pass
2412	MCS1	20.9	30.0	Pass
2437	MCS1	22.1	30.0	Pass
2462	MCS1	21.4	30.0	Pass
2412	MCS2	20.5	30.0	Pass
2437	MCS2	21.9	30.0	Pass
2462	MCS2	21.0	30.0	Pass
2412	MCS3	20.7	30.0	Pass
2437	MCS3	21.6	30.0	Pass
2462	MCS3	20.8	30.0	Pass
2412	MCS4	20.5	30.0	Pass
2437	MCS4	21.6	30.0	Pass
2462	MCS4	21.1	30.0	Pass
2412	MCS5	21.1	30.0	Pass
2437	MCS5	21.0	30.0	Pass
2462	MCS5	21.3	30.0	Pass
2412	MCS6	20.7	30.0	Pass
2437	MCS6	21.1	30.0	Pass
2462	MCS6	21.2	30.0	Pass
2412	MCS7	19.7	30.0	Pass
2437	MCS7	20.0	30.0	Pass
2462	MCS7	20.3	30.0	Pass

Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : 802.11b, power setting = 0
Test Performed : Peak EIRP
Test Date : January 14, 2019

Frequency MHz	Data Rate Mbps	Measured Peak Power dBm	Antenna Gain dBi	Peak EIRP dBm	EIRP Limit dBm	Result
2412	1	17.7	1.1	18.8	36.0	Pass
2437	1	17.9	1.1	19.0	36.0	Pass
2462	1	18.4	1.1	19.5	36.0	Pass
2412	2	17.6	1.1	18.7	36.0	Pass
2437	2	18.0	1.1	19.1	36.0	Pass
2462	2	18.5	1.1	19.6	36.0	Pass
2412	5.5	20.2	1.1	21.3	36.0	Pass
2437	5.5	20.7	1.1	21.8	36.0	Pass
2462	5.5	21.3	1.1	22.4	36.0	Pass
2412	5.5	17.7	1.1	18.8	36.0	Pass
2437	11	18.4	1.1	19.5	36.0	Pass
2462	11	18.9	1.1	20.0	36.0	Pass

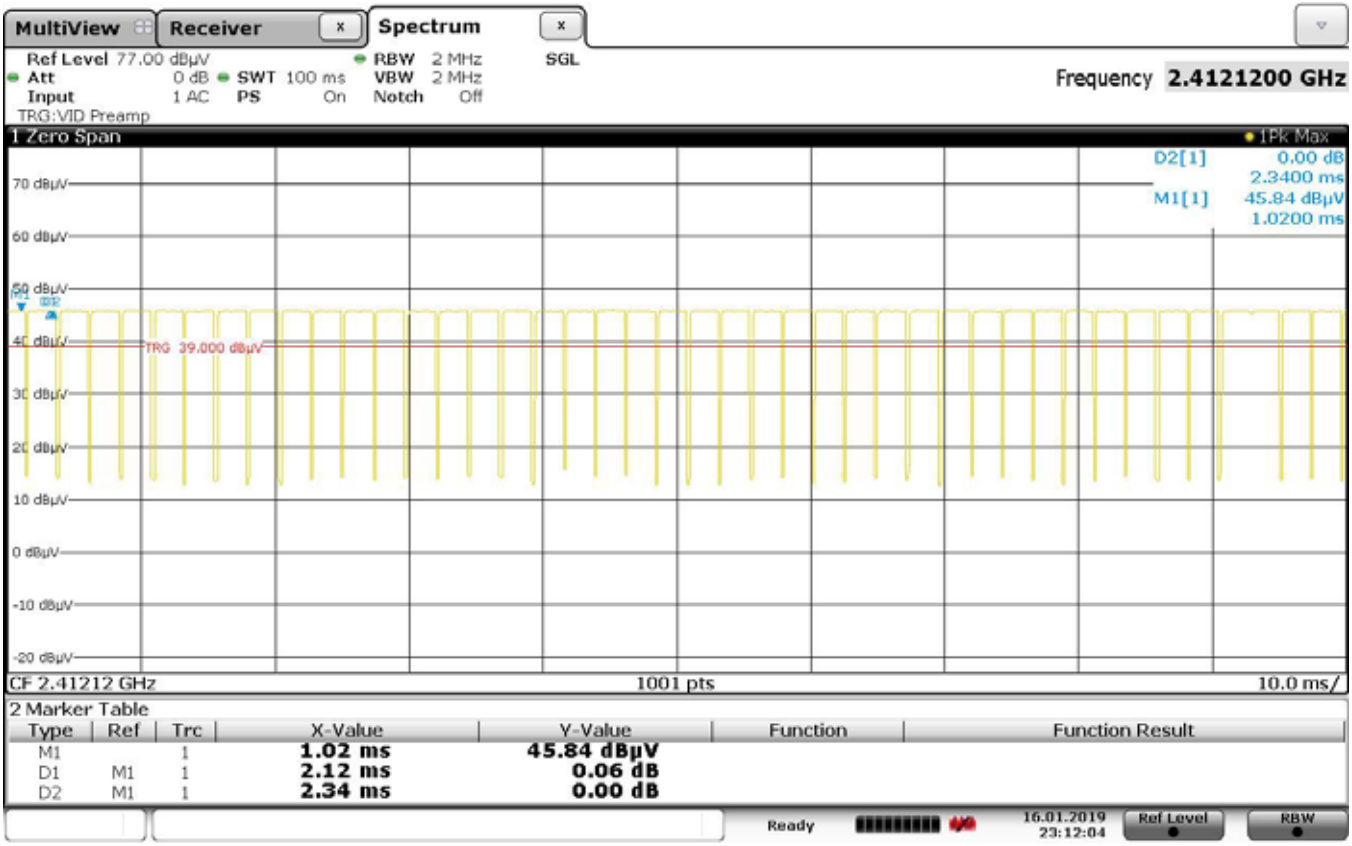
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : 802.11g, power setting = 0
Test Performed : Peak EIRP
Test Date : January 14, 2019

Frequency MHz	Data Rate Mbps	Measured Peak Power dBm	Antenna Gain dBi	Peak EIRP dBm	EIRP Limit dBm	Result
2412	6	20.6	1.1	21.7	36.0	Pass
2437	6	21.9	1.1	23.0	36.0	Pass
2462	6	21.1	1.1	22.2	36.0	Pass
2412	9	20.9	1.1	22.0	36.0	Pass
2437	9	22.1	1.1	23.2	36.0	Pass
2462	9	21.2	1.1	22.3	36.0	Pass
2412	12	21.0	1.1	22.1	36.0	Pass
2437	12	22.1	1.1	23.2	36.0	Pass
2462	12	21.5	1.1	22.6	36.0	Pass
2412	18	20.8	1.1	21.9	36.0	Pass
2437	18	22.2	1.1	23.3	36.0	Pass
2462	18	21.3	1.1	22.4	36.0	Pass
2412	24	21.0	1.1	22.1	36.0	Pass
2437	24	21.8	1.1	22.9	36.0	Pass
2462	24	21.6	1.1	22.7	36.0	Pass
2412	36	21.1	1.1	22.2	36.0	Pass
2437	36	21.9	1.1	23.0	36.0	Pass
2462	36	21.6	1.1	22.7	36.0	Pass
2412	48	21.0	1.1	22.1	36.0	Pass
2437	48	21.4	1.1	22.5	36.0	Pass
2462	48	21.3	1.1	22.4	36.0	Pass
2412	54	20.9	1.1	22.0	36.0	Pass
2437	54	21.5	1.1	22.6	36.0	Pass
2462	54	21.4	1.1	22.5	36.0	Pass

Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 4 and Ventis Pro 5
Serial No. : WiFi Board Unit #2
Test Mode : 802.11n, power setting = 0
Test Performed : Peak EIRP
Test Date : January 14, 2019

Frequency MHz	Data Rate	Measured Peak Power dBm	Antenna Gain dBi	Peak EIRP dBm	Power Limit dBm	Result
2412	MCS0	21.3	1.1	22.4	36.0	Pass
2437	MCS0	22.4	1.1	23.5	36.0	Pass
2462	MCS0	21.8	1.1	22.9	36.0	Pass
2412	MCS1	20.9	1.1	22.0	36.0	Pass
2437	MCS1	22.1	1.1	23.2	36.0	Pass
2462	MCS1	21.4	1.1	22.5	36.0	Pass
2412	MCS2	20.5	1.1	21.6	36.0	Pass
2437	MCS2	21.9	1.1	23.0	36.0	Pass
2462	MCS2	21.0	1.1	22.1	36.0	Pass
2412	MCS3	20.7	1.1	21.8	36.0	Pass
2437	MCS3	21.6	1.1	22.7	36.0	Pass
2462	MCS3	20.8	1.1	21.9	36.0	Pass
2412	MCS4	20.5	1.1	21.6	36.0	Pass
2437	MCS4	21.6	1.1	22.7	36.0	Pass
2462	MCS4	21.1	1.1	22.2	36.0	Pass
2412	MCS5	21.1	1.1	22.2	36.0	Pass
2437	MCS5	21.0	1.1	22.1	36.0	Pass
2462	MCS5	21.3	1.1	22.4	36.0	Pass
2412	MCS6	20.7	1.1	21.8	36.0	Pass
2437	MCS6	21.1	1.1	22.2	36.0	Pass
2462	MCS6	21.2	1.1	22.3	36.0	Pass
2412	MCS7	19.7	1.1	20.8	36.0	Pass
2437	MCS7	20.0	1.1	21.1	36.0	Pass
2462	MCS7	20.3	1.1	21.4	36.0	Pass

Manufacturer	: Industrial Scientific Corporation
Test Item	: Gas Monitor
Model No.	: Ventis Pro 5
Serial No.	: 18103FE-007
Test Mode	: 802.11b, 5.5Mbps, power setting = 0
Test Performed	: Duty Cycle
Test Date	: January 16, 2019
Notes	: Pulse on time = 2.12msec, Off time = 0.22msec

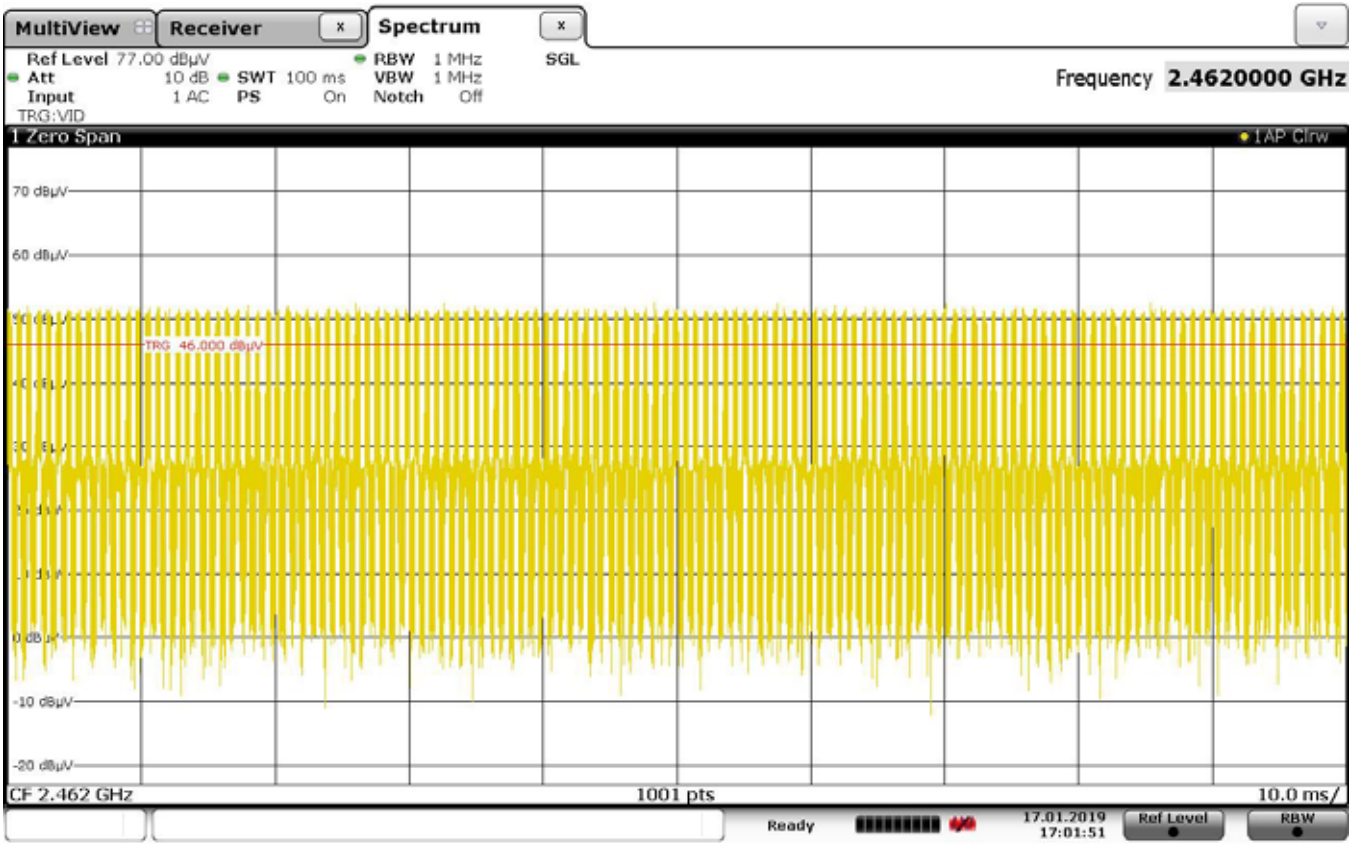


Date: 16.JAN.2019 23:12:04

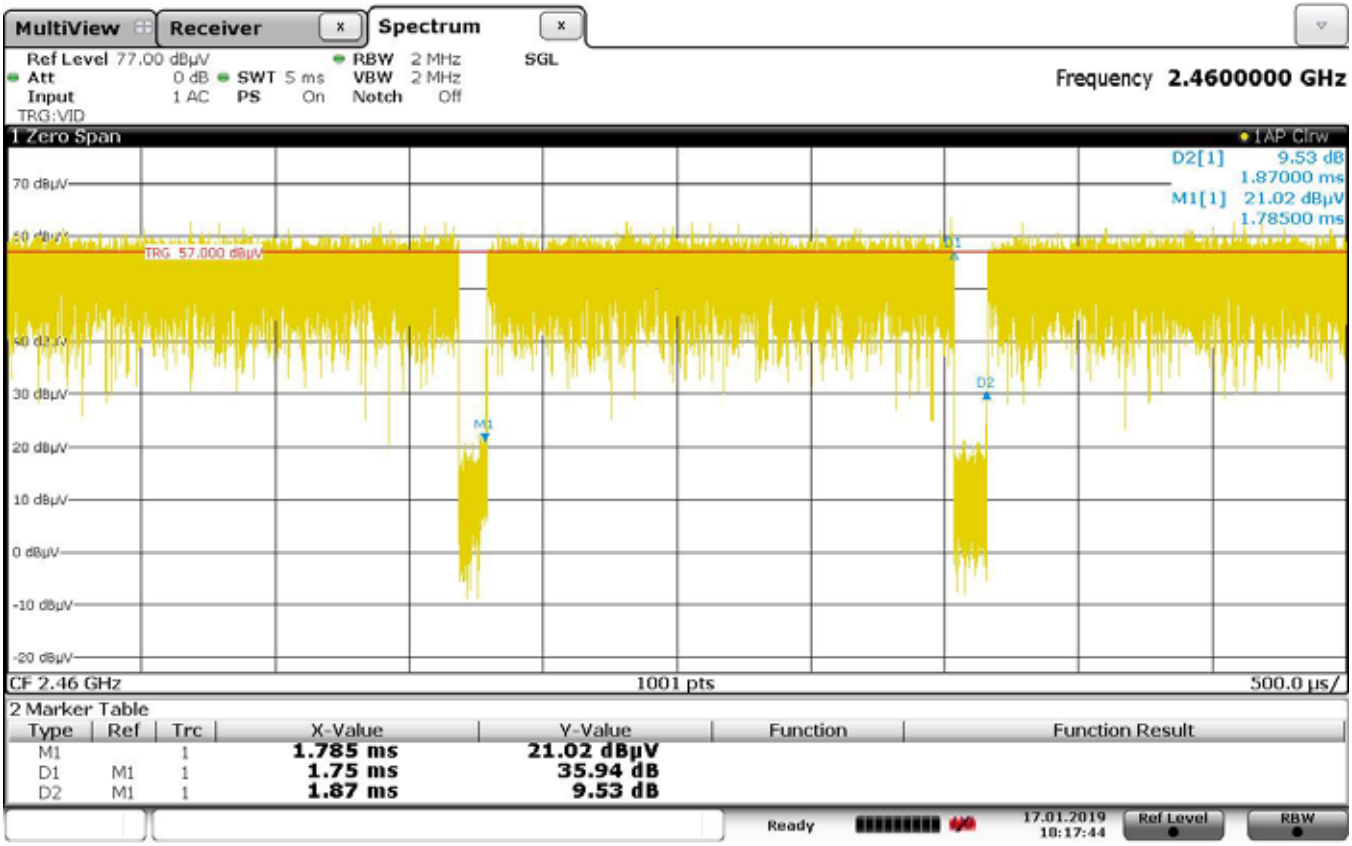
Manufacturer	: Industrial Scientific Corporation
Test Item	: Gas Monitor
Model No.	: Ventis Pro 5
Serial No.	: 18103FE-007
Test Mode	: 802.11b, 5.5Mbps, power setting = 0
Test Performed	: Duty Cycle
Test Date	: January 16, 2019
Notes	: Pulse on time in 100msec = 2.12msec x 43 pulses = 91.16msec
	: Duty Cycle Correction Factor = 20 x log (1/(91.16msec/100msec))
	: Duty Cycle Correction Factor = 0.803

Date: 17.JAN.2019 16:52:12

Manufacturer	: Industrial Scientific Corporation
Test Item	: Gas Monitor
Model No.	: Ventis Pro 5
Serial No.	: 18103FE-007
Test Mode	: 802.11g, 36Mbps, power setting = 0
Test Performed	: Duty Cycle
Test Date	: January 16, 2019
Notes	: Pulse on time = 345usec, Off time = 400usec



Manufacturer	: Industrial Scientific Corporation
Test Item	: Gas Monitor
Model No.	: Ventis Pro 5
Serial No.	: 18103FE-007
Test Mode	: 802.11g, 36Mbps, power setting = 0
Test Performed	: Duty Cycle
Test Date	: January 16, 2019
Notes	: Pulse on time in 100msec = 345usec x 136 pulses = 46.92msec
	: Duty Cycle Correction Factor = 20 x log (1/(46.92msec/100msec))
	: Duty Cycle Correction Factor = 6.57

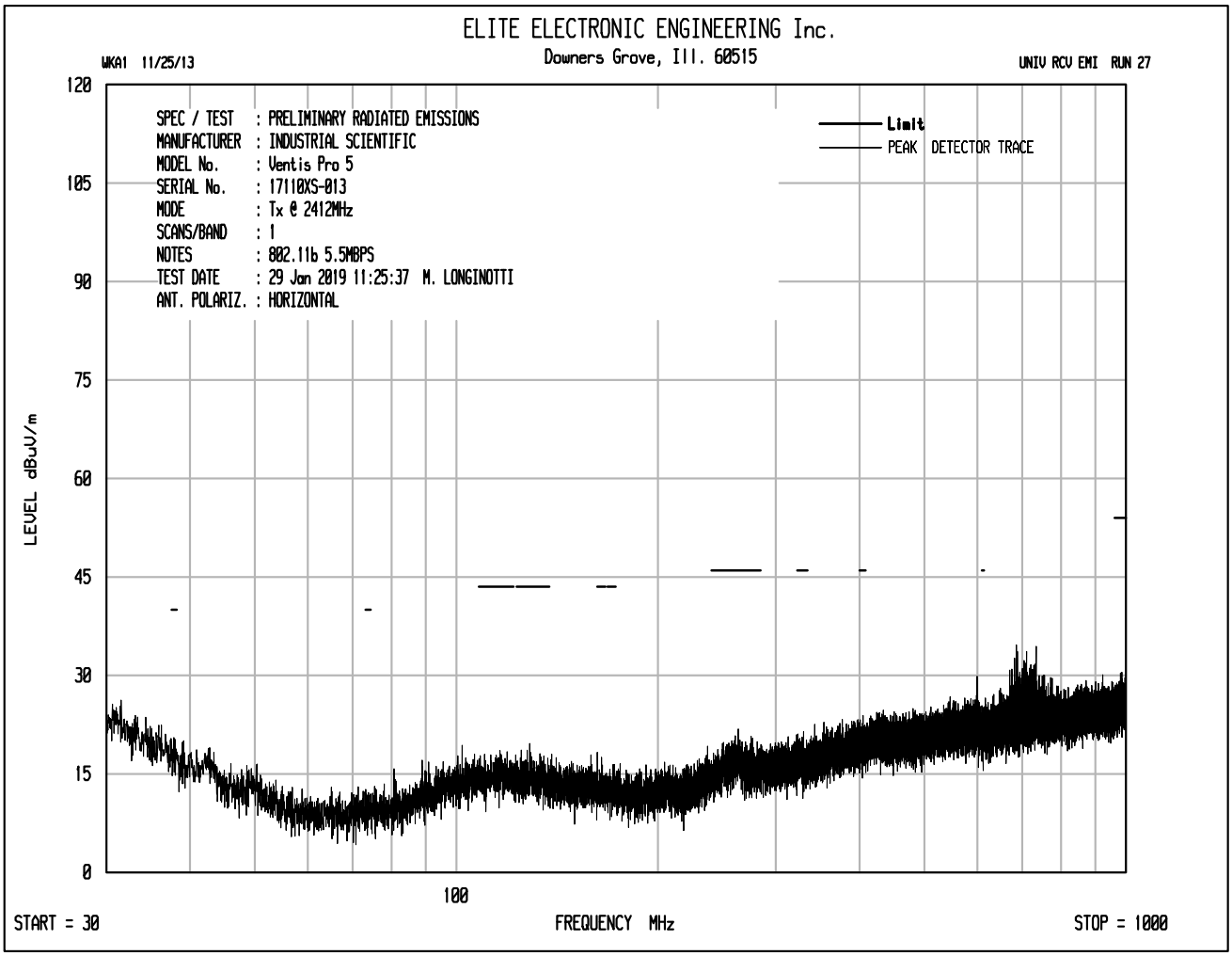


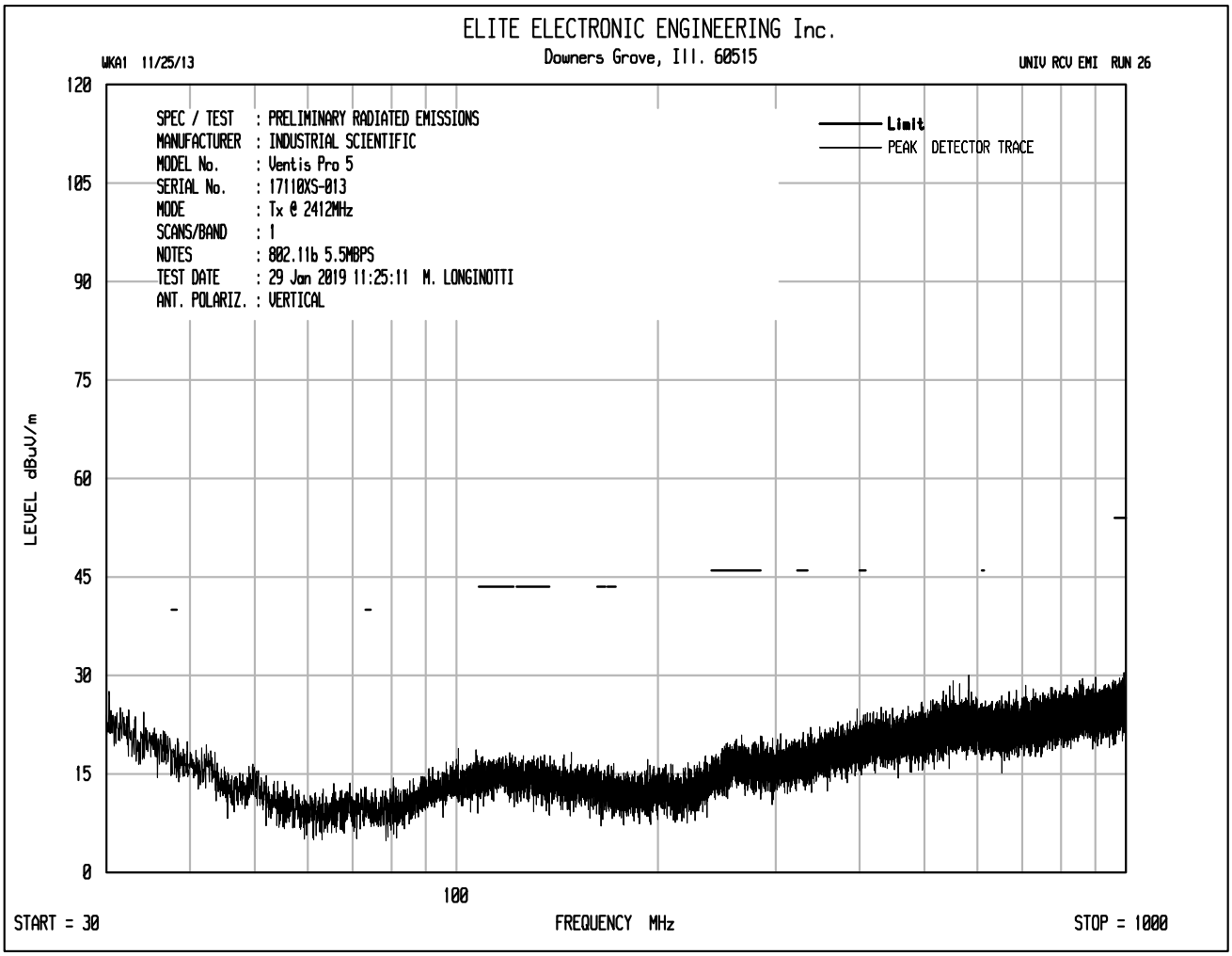
Date: 17.JAN.2019 18:17:45

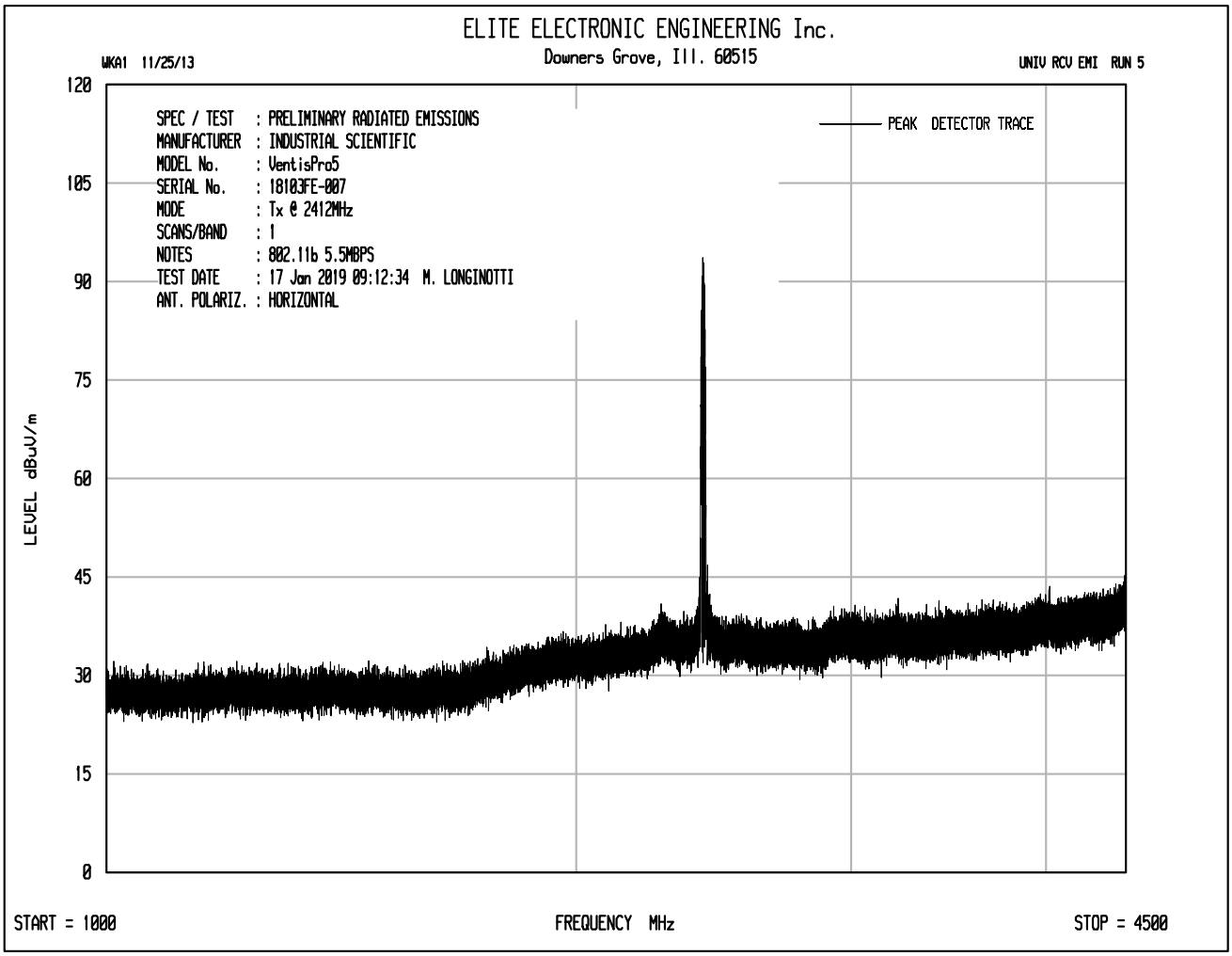
Manufacturer	: Industrial Scientific Corporation
Test Item	: Gas Monitor
Model No.	: Ventis Pro 5
Serial No.	: 18103FE-007
Test Mode	: 802.11n, MCS0, power setting = 0
Test Performed	: Duty Cycle
Test Date	: January 16, 2019
Notes	: Pulse on time = 1.75msec, Off time = 120usec

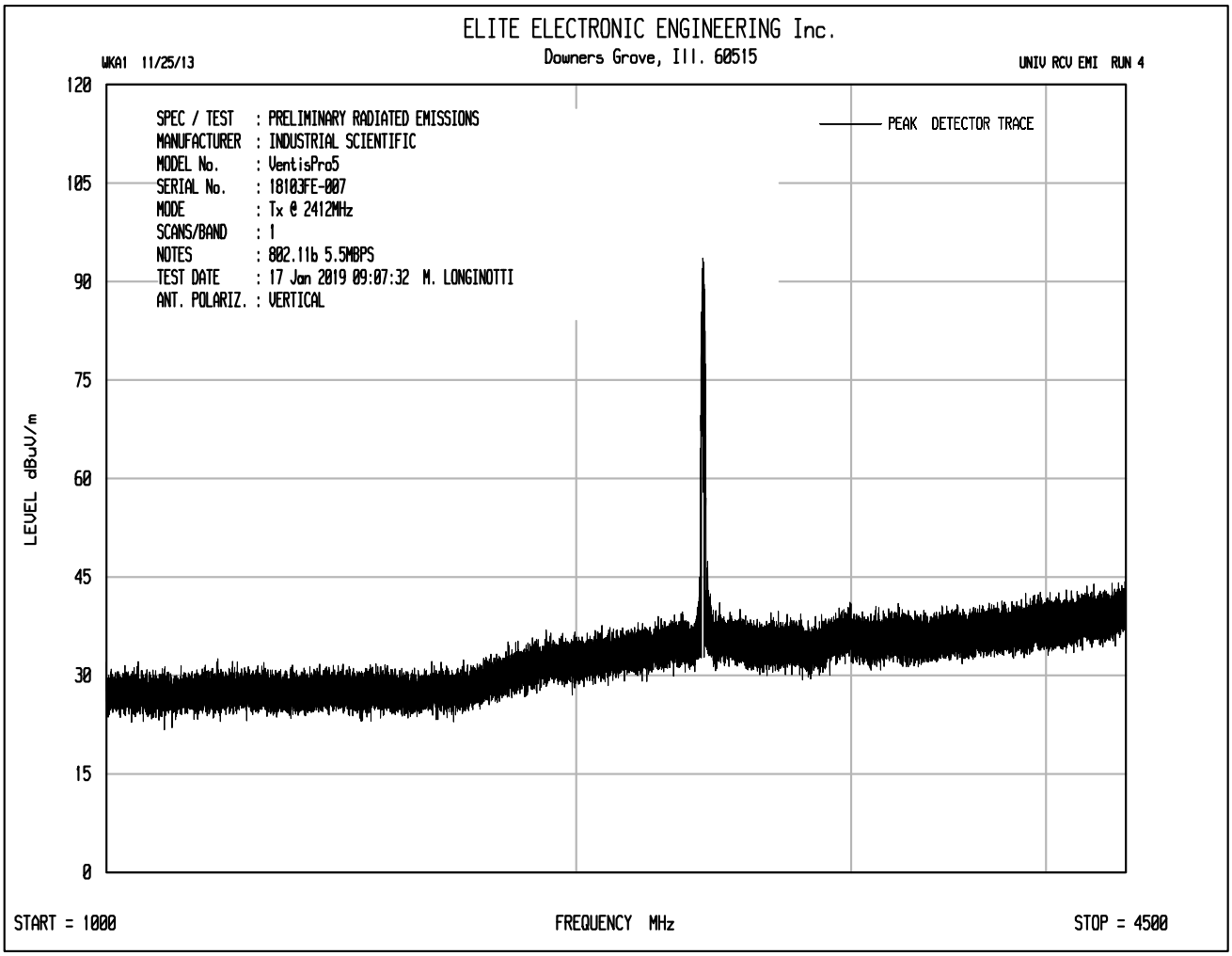
Date: 17.JAN.2019 18:22:53

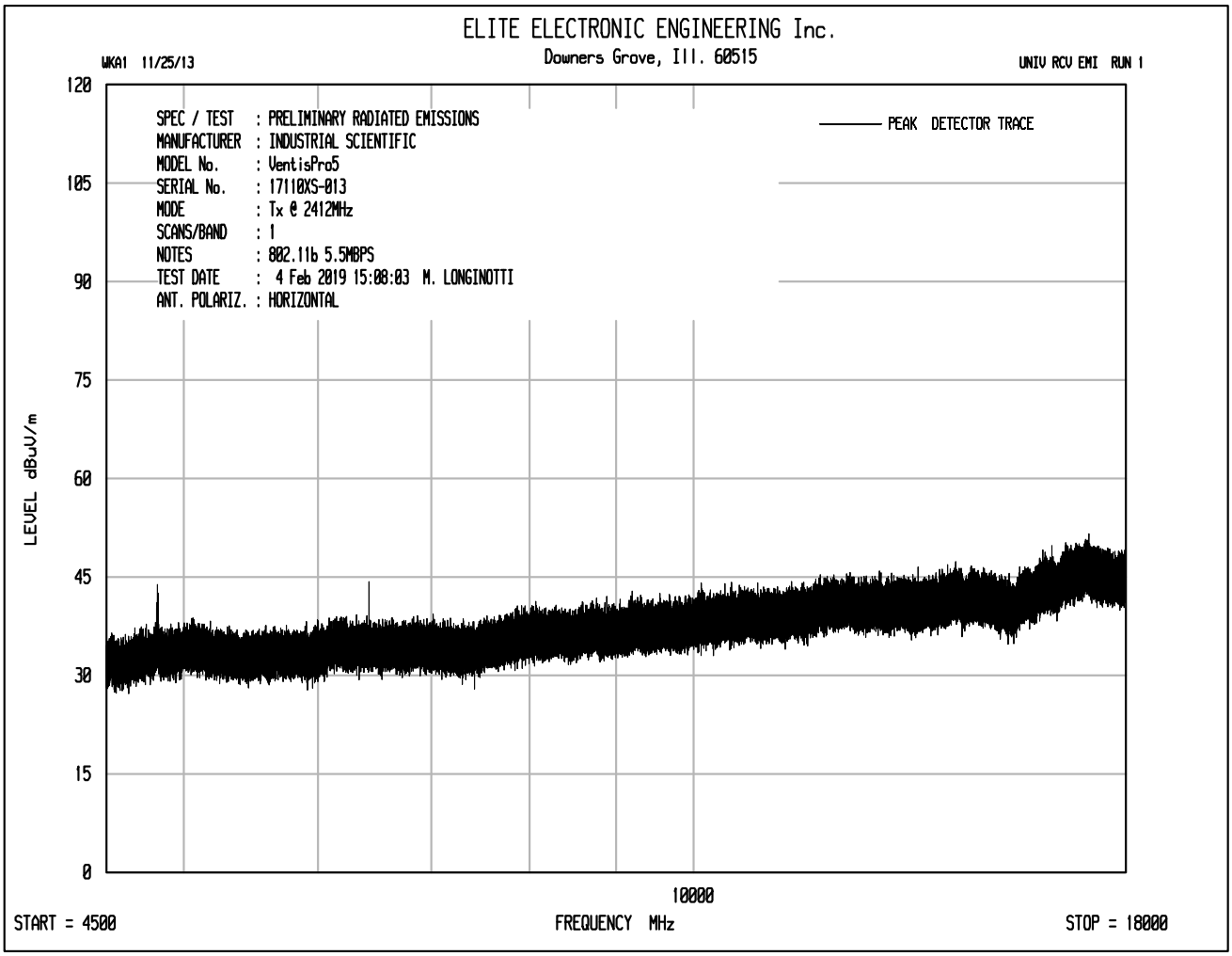
Manufacturer	: Industrial Scientific Corporation
Test Item	: Gas Monitor
Model No.	: Ventis Pro 5
Serial No.	: 18103FE-007
Test Mode	: 802.11n, MCS0, power setting = 0
Test Performed	: Duty Cycle
Test Date	: January 16, 2019
Notes	: Pulse on time in 100msec = 1.75msec x 53 pulses = 92.75msec
	: Duty Cycle Correction Factor = 20 x log (1/(92.75msec/100msec))
	: Duty Cycle Correction Factor = 0.654

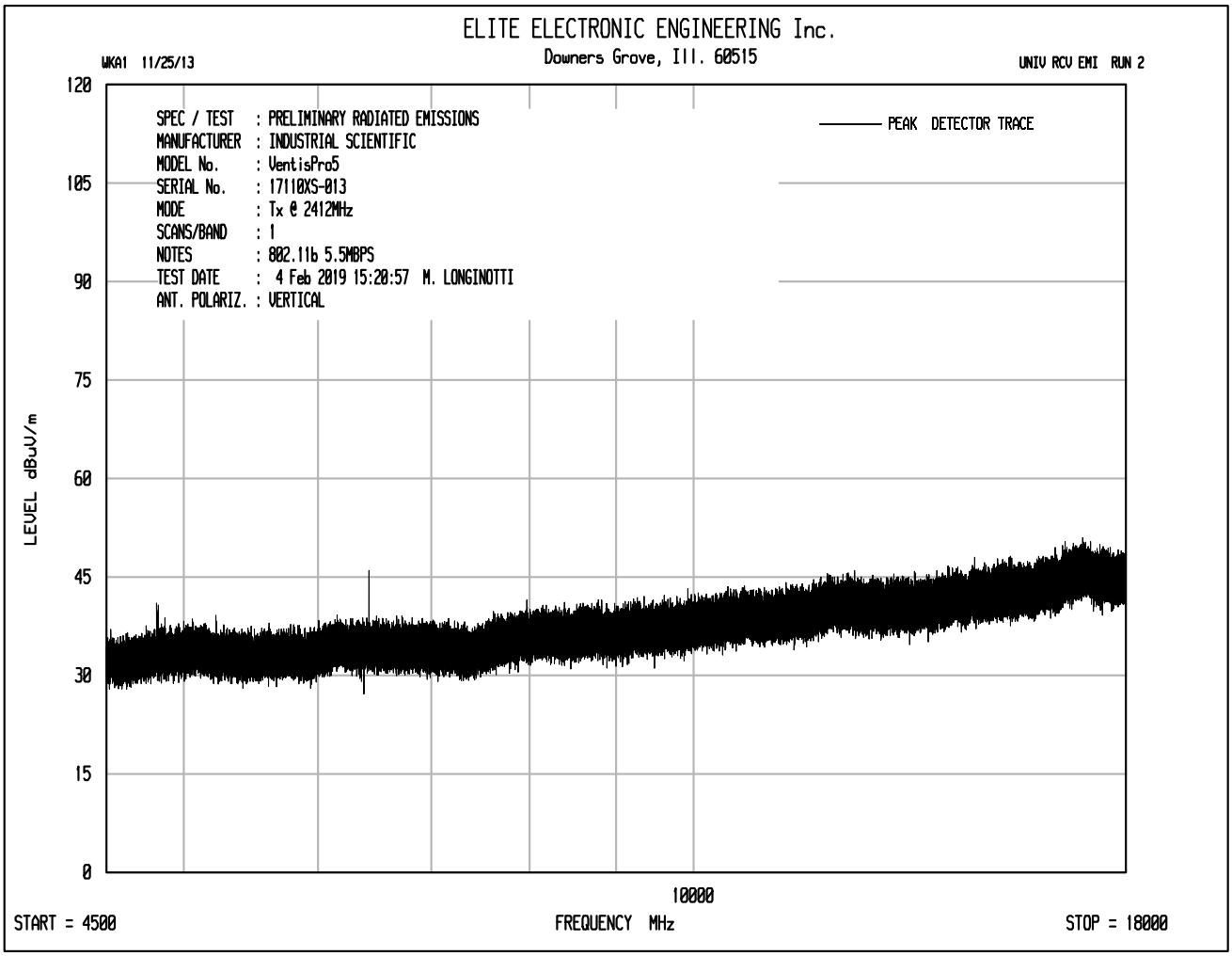

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 27
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : Ventis Pro 5
SERIAL No. : 17110XS-013
MODE : Tx @ 2412MHz
SCANS/BAND : 1
NOTES : 802.11b 5.5MBPS
TEST DATE : 29 Jan 2019 11:25:37 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

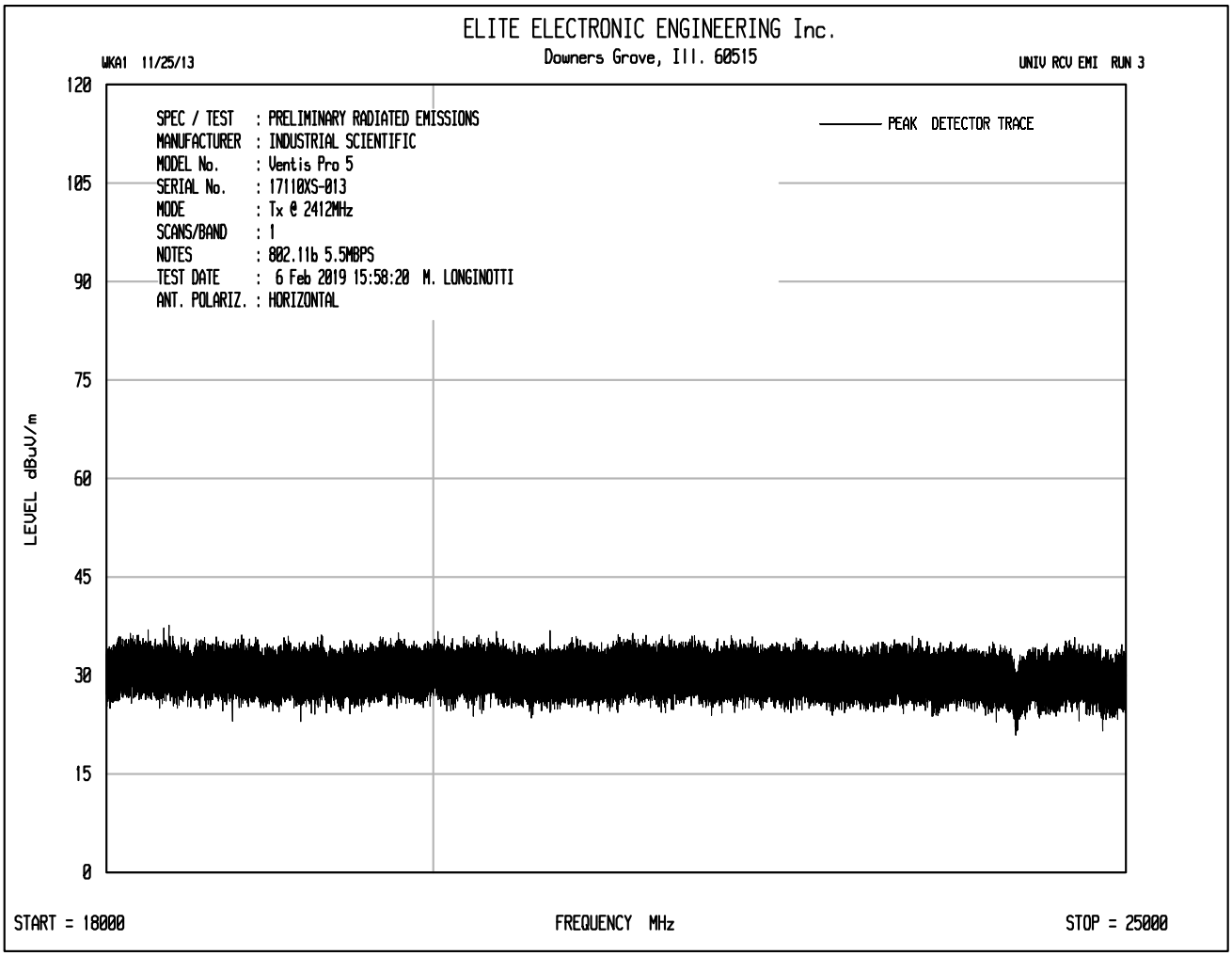

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 26
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : Ventis Pro 5
SERIAL No. : 17110XS-013
MODE : Tx @ 2412MHz
SCANS/BAND : 1
NOTES : 802.11b 5.5MBPS
TEST DATE : 29 Jan 2019 11:25:11 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

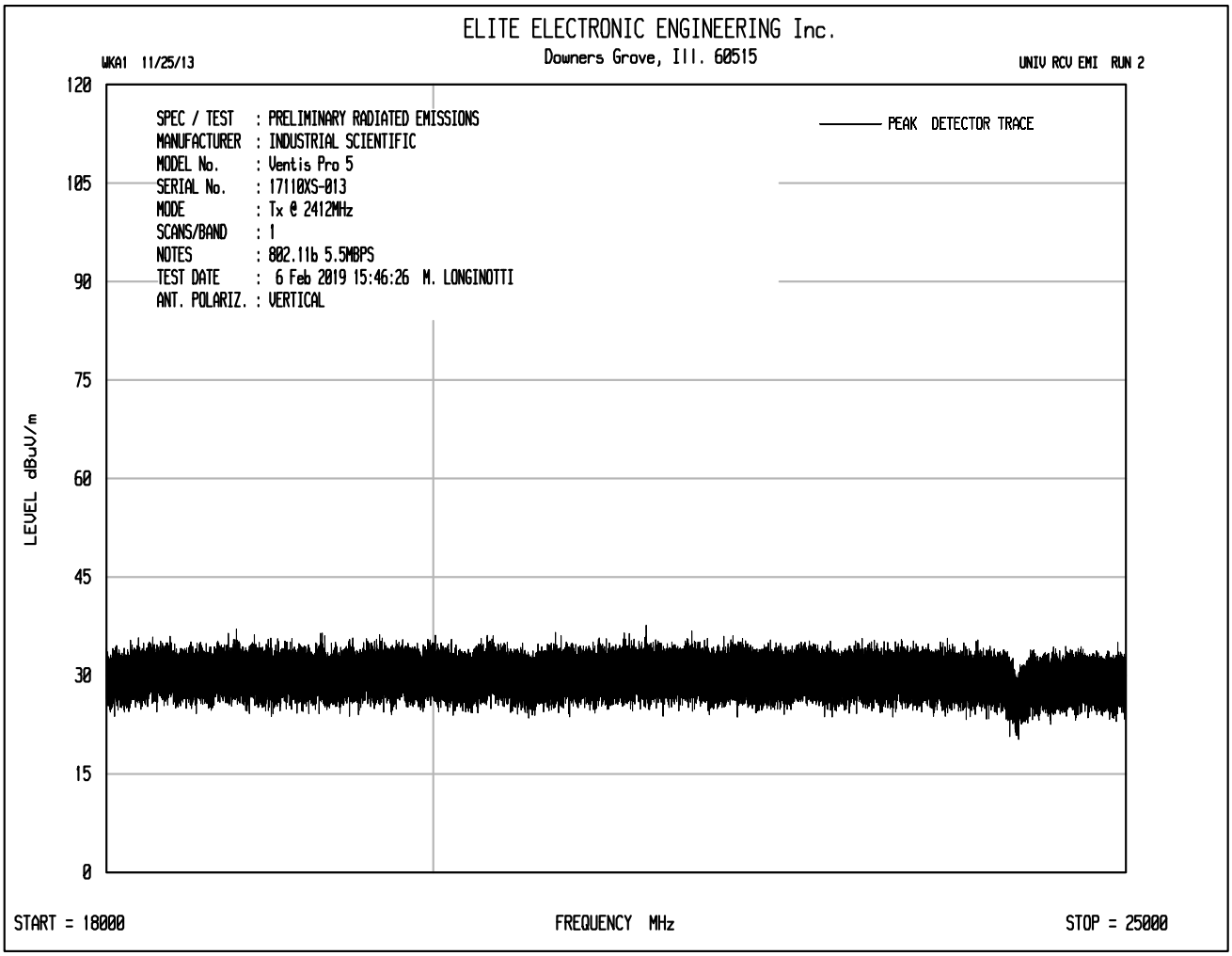

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 5
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : VentisPro5
SERIAL No. : 18103FE-007
MODE : Tx @ 2412MHz
SCANS/BAND : 1
NOTES : 802.11b 5.5MBPS
TEST DATE : 17 Jan 2019 09:12:34 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 4
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : VentisPro5
SERIAL No. : 18103FE-007
MODE : Tx @ 2412MHz
SCANS/BAND : 1
NOTES : 802.11b 5.5MBPS
TEST DATE : 17 Jan 2019 09:07:32 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 1
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : VentisPro5
SERIAL No. : 17110XS-013
MODE : Tx @ 2412MHz
SCANS/BAND : 1
NOTES : 802.11b 5.5MBPS
TEST DATE : 4 Feb 2019 15:08:03 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 2
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : VentisPro5
SERIAL No. : 17110XS-013
MODE : Tx @ 2412MHz
SCANS/BAND : 1
NOTES : 802.11b 5.5MBPS
TEST DATE : 4 Feb 2019 15:20:57 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 3
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : Ventis Pro 5
SERIAL No. : 17110XS-013
MODE : Tx @ 2412MHz
SCANS/BAND : 1
NOTES : 802.11b 5.5MBPS
TEST DATE : 6 Feb 2019 15:58:20 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 2
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : Ventis Pro 5
SERIAL No. : 17110XS-013
MODE : Tx @ 2412MHz
SCANS/BAND : 1
NOTES : 802.11b 5.5MBPS
TEST DATE : 6 Feb 2019 15:46:26 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 5
Serial No. : 17110XS-013
Mode : Transmit at 2412MHz, 802.11b 5.5Mbps, power = 0
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : January 17, 2019 through February 6, 2019
Test Distance : 3 meters
Notes : Peak Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
4824.00	H	53.0		3.7	36.8	-39.3	54.1	509.2	5000.0	-19.8
4824.00	V	53.6		3.7	36.8	-39.3	54.7	545.6	5000.0	-19.2
12060.00	H	50.2	Ambient	6.1	41.8	-39.1	58.9	883.1	5000.0	-15.1
12060.00	V	49.5	Ambient	6.1	41.8	-39.1	58.2	814.7	5000.0	-15.8
14472.00	H	49.0	Ambient	6.6	42.1	-38.3	59.5	942.3	5000.0	-14.5
14472.00	V	49.1	Ambient	6.6	42.1	-38.3	59.6	953.2	5000.0	-14.4
19296.00	H	35.1	Ambient	2.2	40.4	-28.5	49.2	287.0	5000.0	-24.8
19296.00	V	34.4	Ambient	2.2	40.4	-28.5	48.5	264.8	5000.0	-25.5

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked By: MARK E. LONGINOTTI

Mark E. Longinotti

Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 5
Serial No. : 17110XS-013
Mode : Transmit at 2412MHz, 802.11b 5.5Mbps, power = 0
Test Specification : FCC-15.247, RSS-247 Average Radiated Emissions in Restricted Bands
Date : January 17, 2019 through February 6, 2019
Test Distance : 3 meters
Notes : Average Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
4824.00	H	40.5		3.7	36.8	-39.3	0.8	42.4	132.4	500.0	-11.5
4824.00	V	39.9		3.7	36.8	-39.3	0.8	41.8	123.6	500.0	-12.1
12060.00	H	35.5	Ambient	6.1	41.8	-39.1	0.8	45.0	178.2	500.0	-9.0
12060.00	V	35.6	Ambient	6.1	41.8	-39.1	0.8	45.1	180.3	500.0	-8.9
14472.00	H	34.1	Ambient	6.6	42.1	-38.3	0.8	45.4	185.9	500.0	-8.6
14472.00	V	34.1	Ambient	6.6	42.1	-38.3	0.8	45.4	185.9	500.0	-8.6
19296.00	H	20.9	Ambient	2.2	40.4	-28.5	0.8	35.8	61.4	500.0	-18.2
19296.00	V	22.0	Ambient	2.2	40.4	-28.5	0.8	36.9	69.6	500.0	-17.1

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp + Duty Cycle

Checked By: MARK E. LONGINOTTI

Mark E. Longinotti

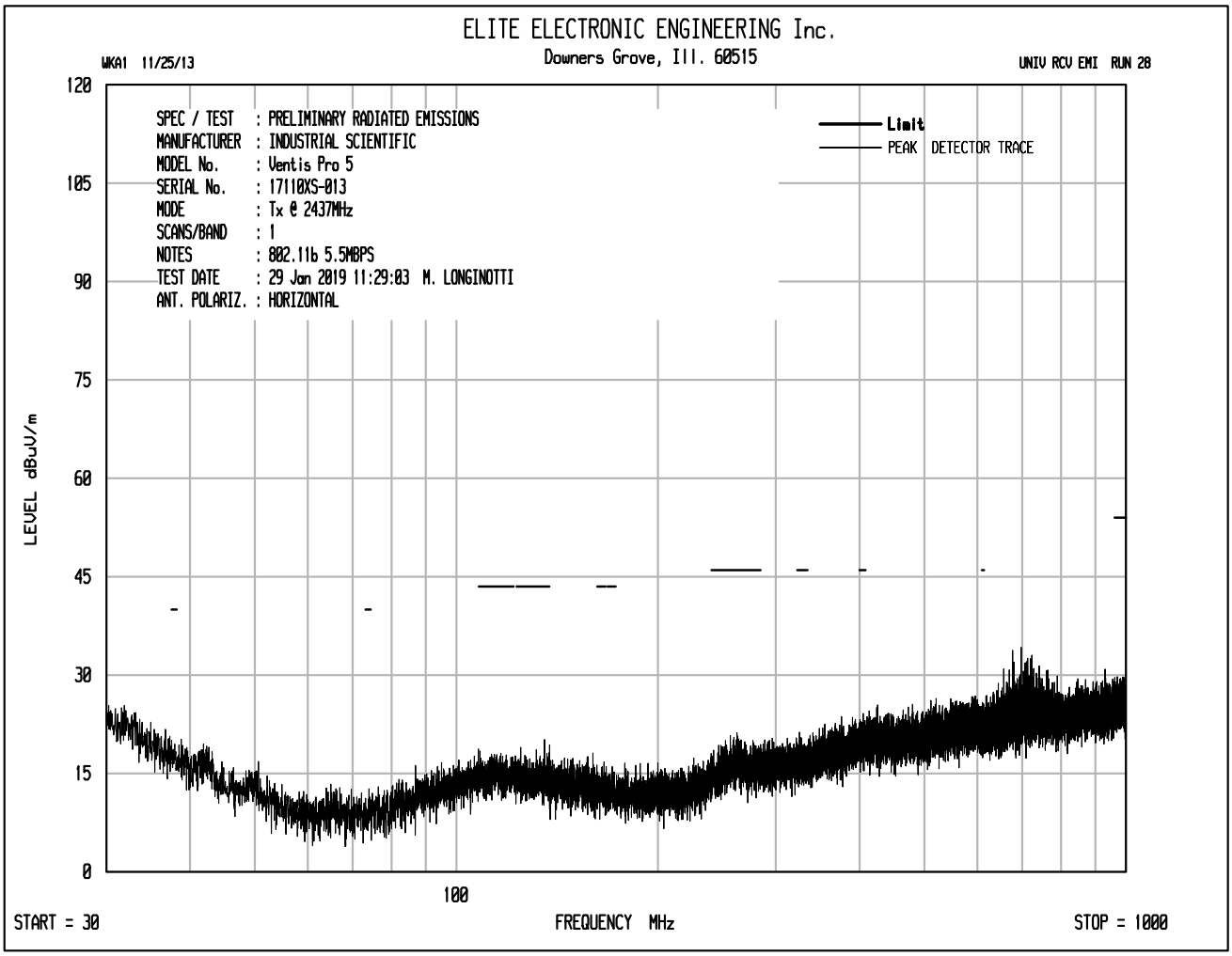
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 5
Serial No. : 18103FE-007 (17110XS-013 used for all but fundamental)
Mode : Transmit at 2412MHz, 802.11b, 5.5Mbps, power = 0
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions not in Restricted Bands
Date : January 17, 2019 through February 6, 2019
Test Distance : 3 meters
Notes : Peak Detector with 100kHz Resolution Bandwidth

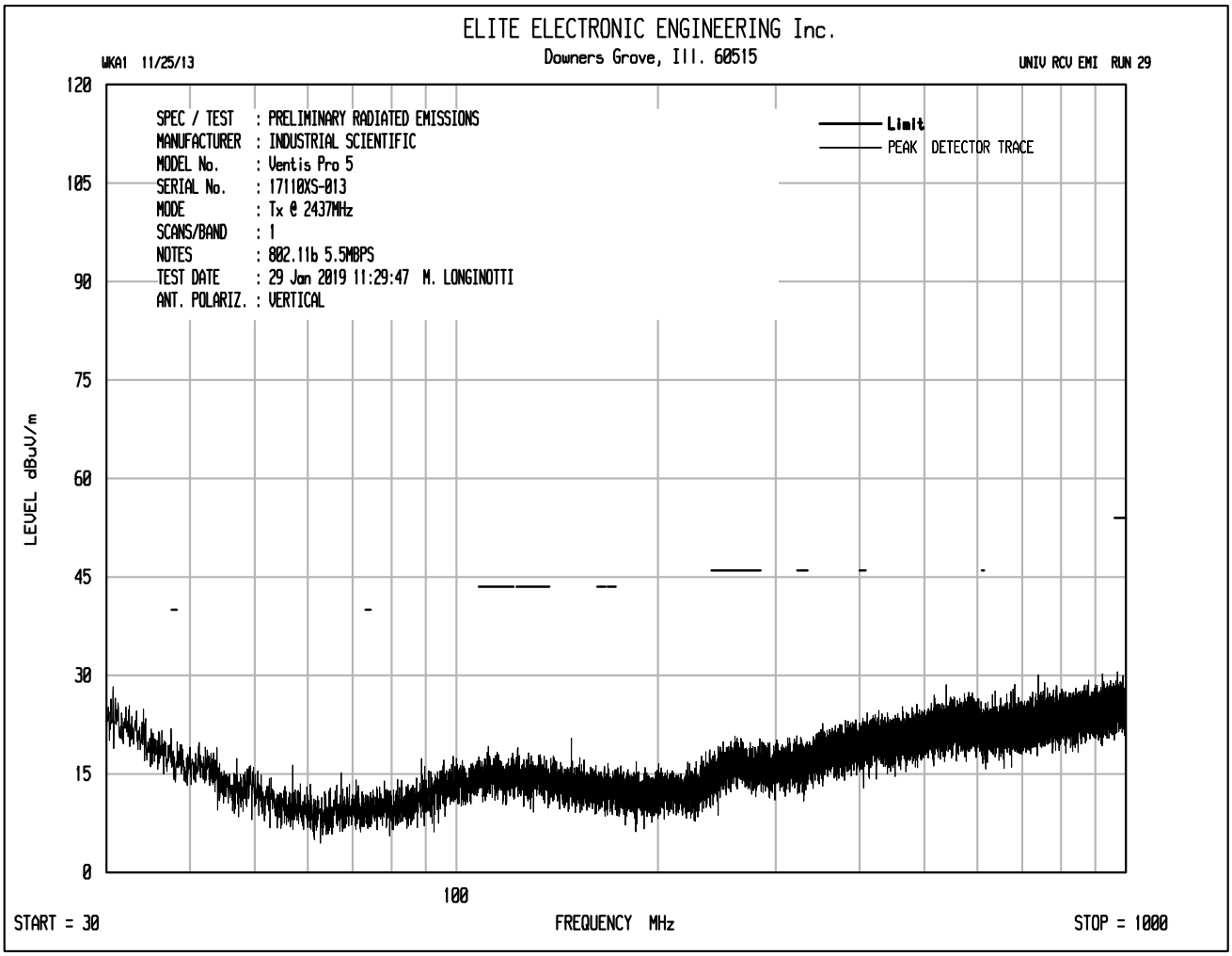
Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2412.00	H	59.0		2.6	33.6	0.0	95.2	57689.0		
2412.00	V	58.9		2.6	33.6	0.0	95.1	57028.6		
7236.00	H	39.1	Ambient	4.7	38.1	-39.4	42.4	132.5	5768.9	-32.8
7236.00	V	39.1	Ambient	4.7	38.1	-39.4	42.4	132.5	5768.9	-32.8
9648.00	H	40.3	Ambient	5.2	39.2	-39.3	45.4	186.6	5768.9	-29.8
9648.00	V	40.5	Ambient	5.2	39.2	-39.3	45.6	190.9	5768.9	-29.6
16884.00	H	38.2	Ambient	7.2	45.1	-37.5	53.0	445.6	5768.9	-22.2
16884.00	V	39.4	Ambient	7.2	45.1	-37.5	54.2	511.6	5768.9	-21.0
21708.00	H	24.3	Ambient	2.2	40.6	-28.9	38.2	81.4	5768.9	-37.0
21708.00	V	24.6	Ambient	2.2	40.6	-28.9	38.5	84.3	5768.9	-36.7
24120.00	H	22.2	Ambient	2.2	40.6	-30.5	34.6	53.4	5768.9	-40.7
24120.00	V	21.1	Ambient	2.2	40.6	-30.5	33.5	47.1	5768.9	-41.8
6432.00	H	53.3		4.3	37.9	-39.4	56.1	637.8	5768.9	-19.1
6432.00	V	50.6		4.3	37.9	-39.4	53.4	467.4	5768.9	-21.8

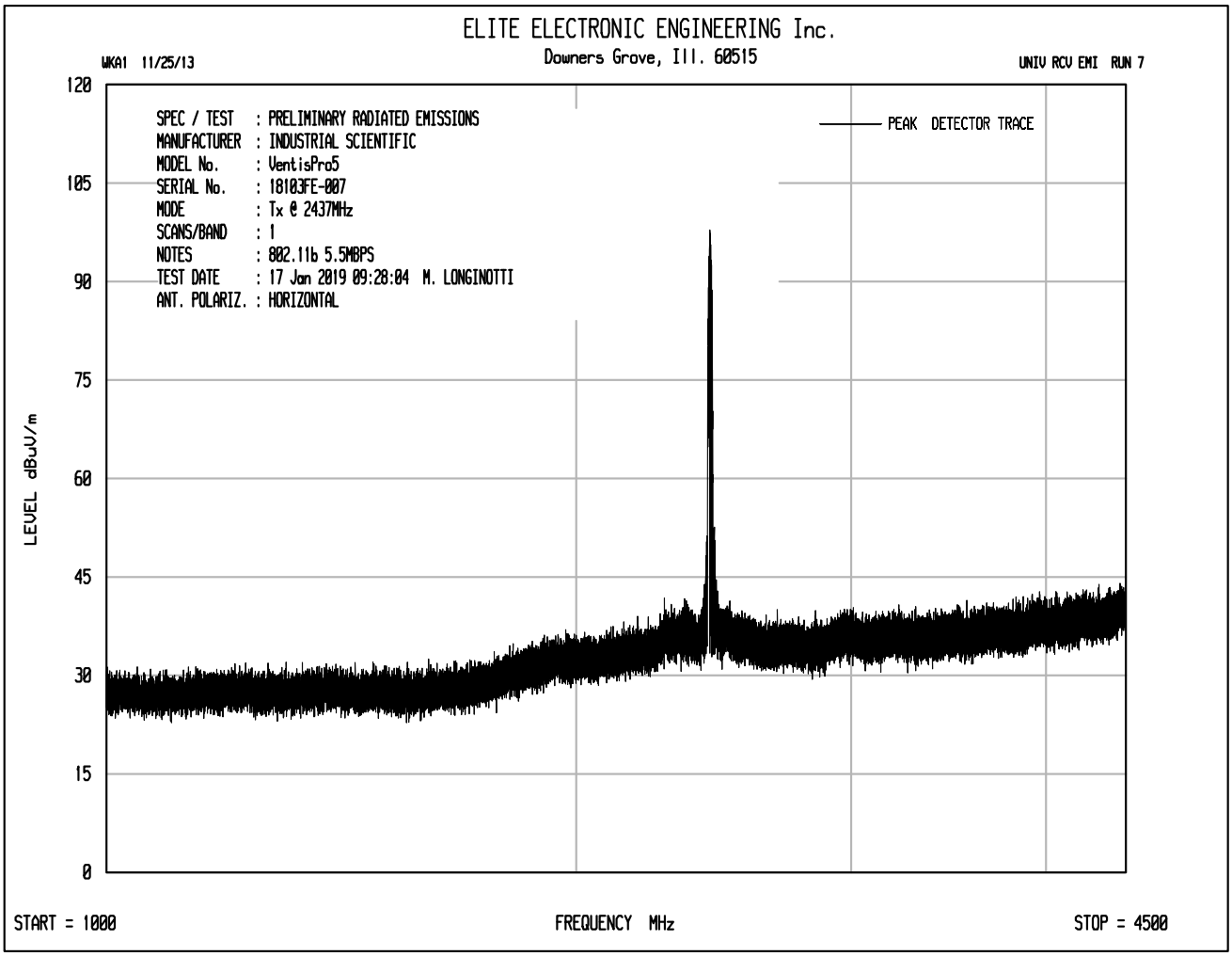
Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

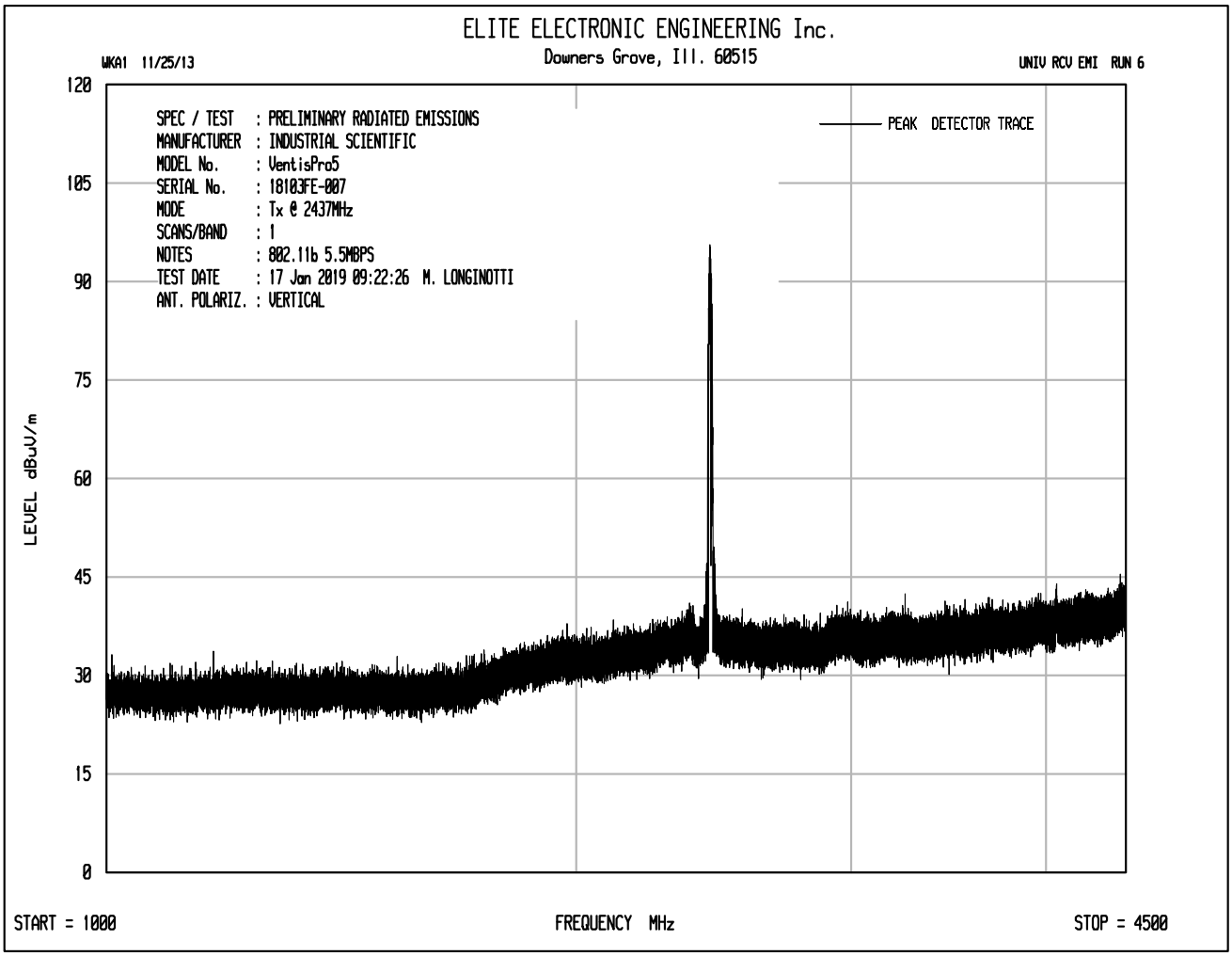
Checked By: MARK E. LONGINOTTI

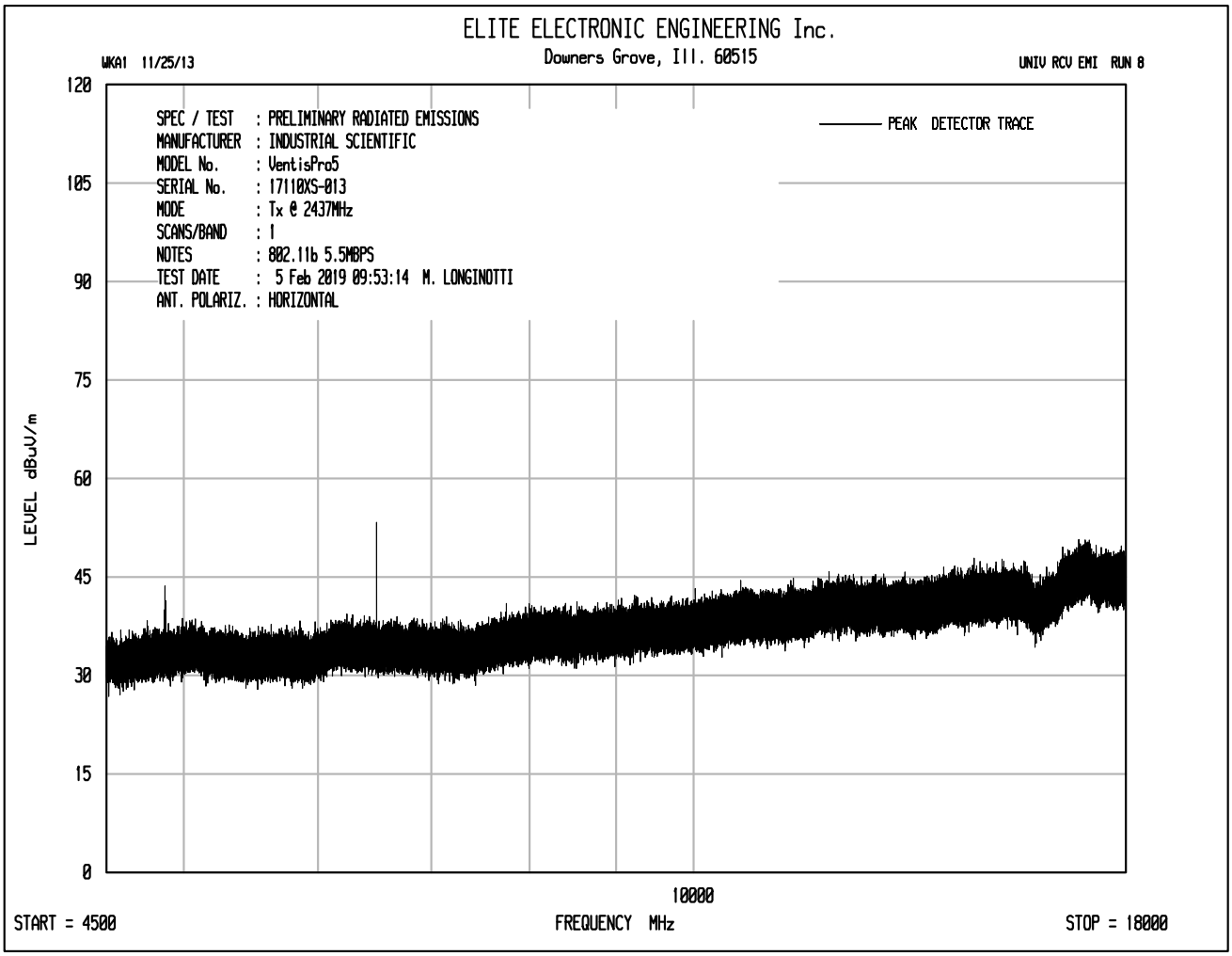
Mark E. Longinotti

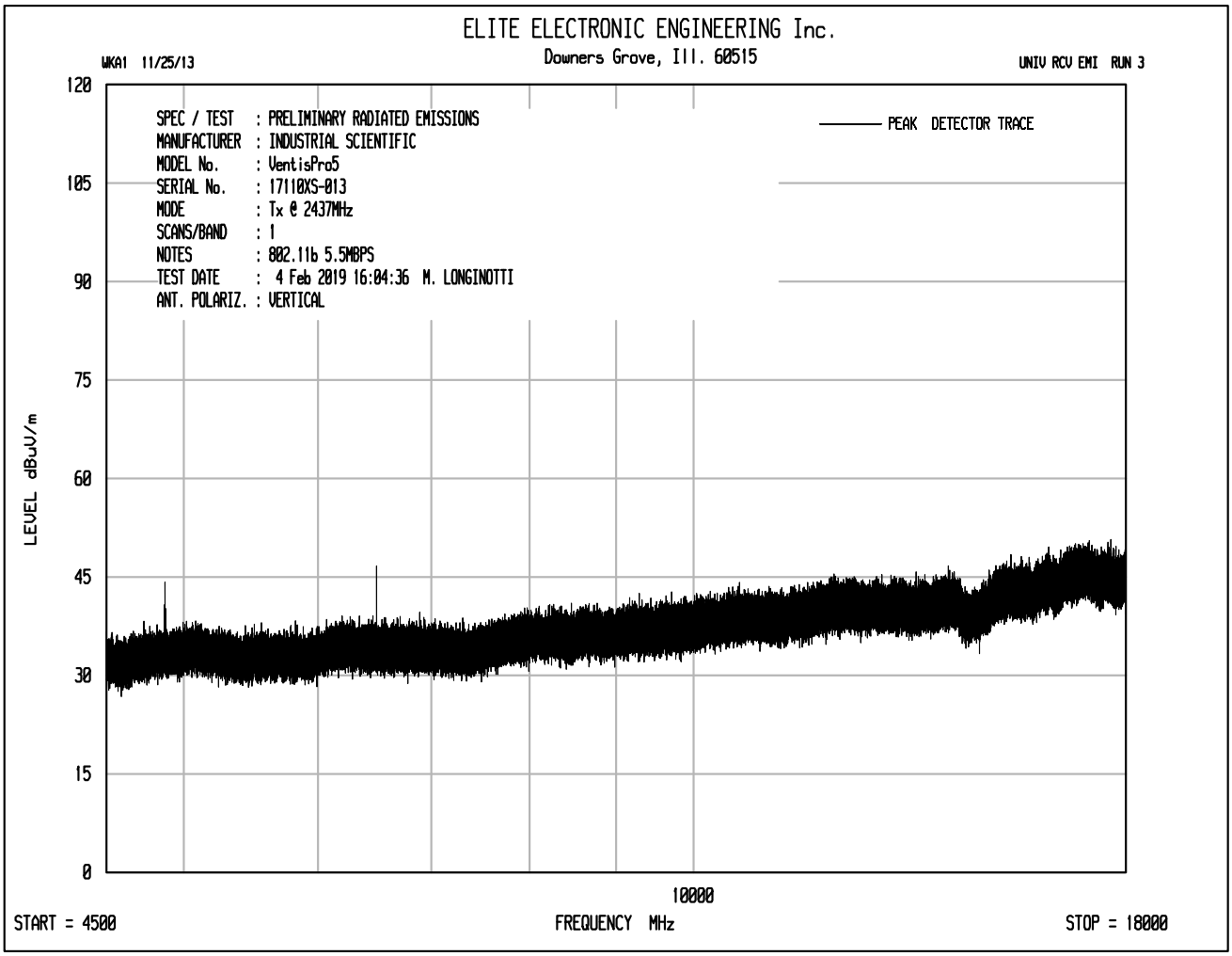

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 20
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : Ventis Pro 5
SERIAL No. : 17110XS-013
MODE : Tx @ 2437MHz
SCANS/BAND : 1
NOTES : 802.11b 5.5MBPS
TEST DATE : 29 Jan 2019 11:29:03 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

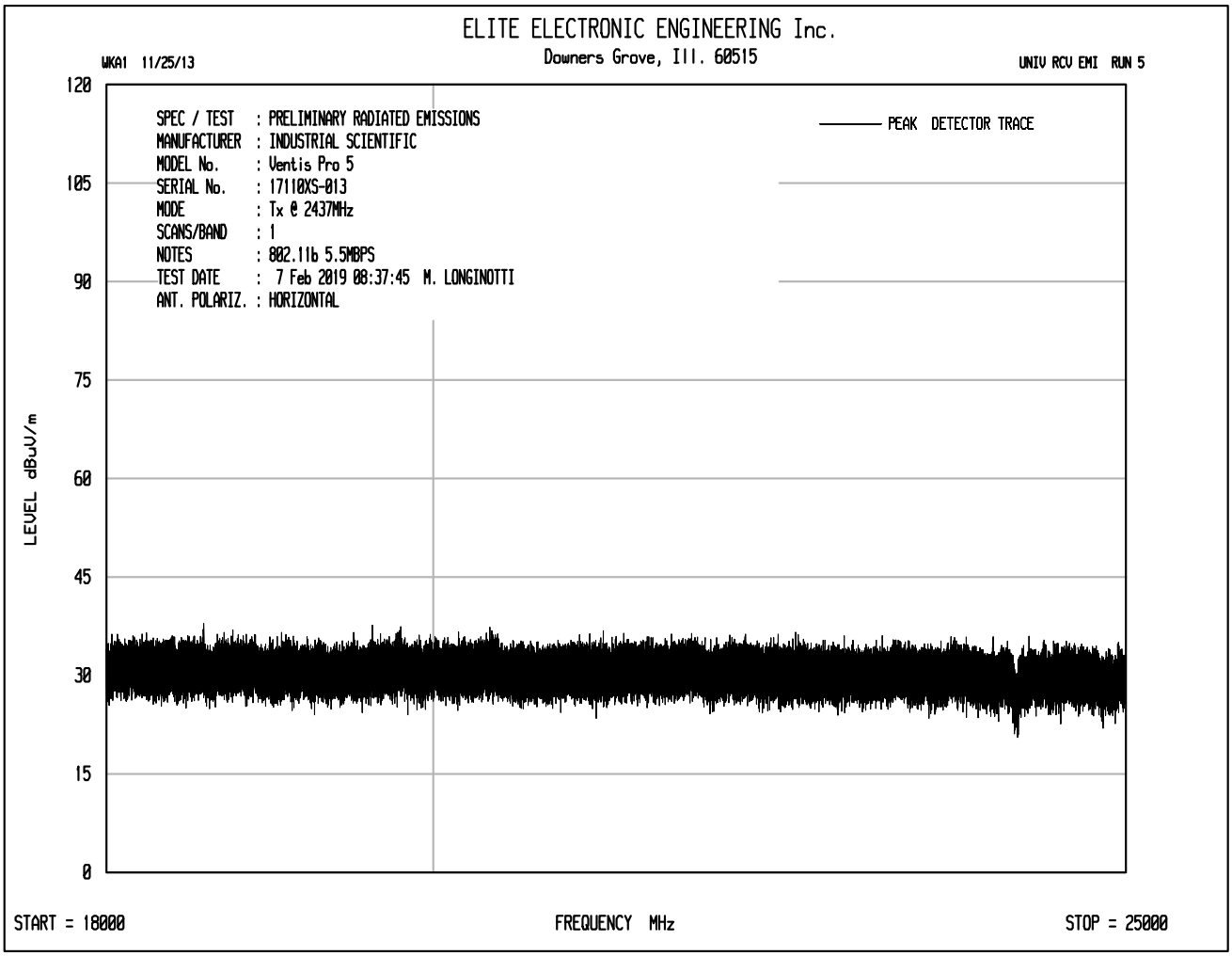

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 29
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : Ventis Pro 5
SERIAL No. : 17110XS-013
MODE : Tx @ 2437MHz
SCANS/BAND : 1
NOTES : 802.11b 5.5MBPS
TEST DATE : 29 Jan 2019 11:29:47 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

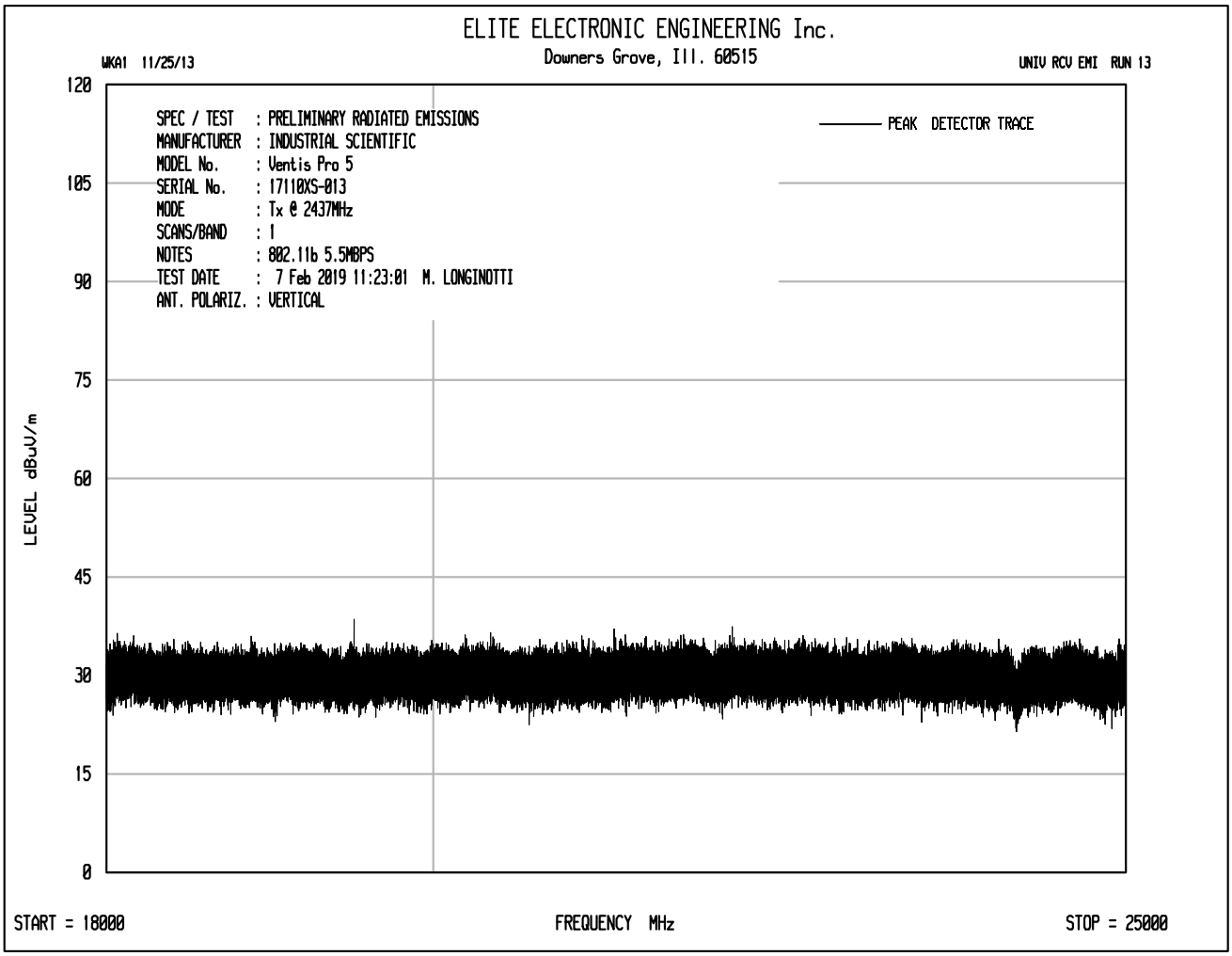

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 7
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : VentisPro5
SERIAL No. : 18103FE-007
MODE : Tx @ 2437MHz
SCANS/BAND : 1
NOTES : 802.11b 5.5MBPS
TEST DATE : 17 Jan 2019 09:28:04 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 6
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : VentisPro5
SERIAL No. : 18103FE-007
MODE : Tx @ 2437MHz
SCANS/BAND : 1
NOTES : 802.11b 5.5MBPS
TEST DATE : 17 Jan 2019 09:22:26 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 8
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : VentisPro5
SERIAL No. : 17110XS-013
MODE : Tx @ 2437MHz
SCANS/BAND : 1
NOTES : 802.11b 5.5MBPS
TEST DATE : 5 Feb 2019 09:53:14 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 3
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : VentisPro5
SERIAL No. : 17110XS-013
MODE : Tx @ 2437MHz
SCANS/BAND : 1
NOTES : 802.11b 5.5MBPS
TEST DATE : 4 Feb 2019 16:04:36 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 5
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : Ventis Pro 5
SERIAL No. : 17110XS-013
MODE : Tx @ 2437MHz
SCANS/BAND : 1
NOTES : 802.11b 5.5MBPS
TEST DATE : 7 Feb 2019 08:37:45 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 13
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : Ventis Pro 5
SERIAL No. : 17110XS-013
MODE : Tx @ 2437MHz
SCANS/BAND : 1
NOTES : 802.11b 5.5MBPS
TEST DATE : 7 Feb 2019 11:23:01 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 5
Serial No. : 18031ZW-005
Mode : Transmit at 2437MHz, 802.11b, 5.5Mbps, power = 0
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : January 17, 2019 through February 7, 2019
Test Distance : 3 meters
Notes : Peak Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
4874.00	H	53.6		3.7	36.7	-39.3	54.6	538.8	5000.0	-19.4
4874.00	V	53.1		3.7	36.7	-39.3	54.1	508.6	5000.0	-19.9
7311.00	H	49.1	Ambient	4.7	38.1	-39.4	52.5	420.5	5000.0	-21.5
7311.00	V	49.2	Ambient	4.7	38.1	-39.4	52.6	425.4	5000.0	-21.4
12185.00	H	50.3	Ambient	6.1	41.8	-39.1	59.1	900.1	5000.0	-14.9
12185.00	V	50.0	Ambient	6.1	41.8	-39.1	58.8	869.5	5000.0	-15.2
19496.00	H	36.2	Ambient	2.2	40.4	-28.8	50.0	316.3	5000.0	-24.0
19496.00	V	36.1	Ambient	2.2	40.4	-28.8	49.9	312.7	5000.0	-24.1

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked By: MARK E. LONGINOTTI

Mark E. Longinotti

Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 5
Serial No. : 18031ZW-005
Mode : Transmit at 2437MHz, 802.11b, 5.5Mbps, power = 0
Test Specification : FCC-15.247, RSS-247 Average Radiated Emissions in Restricted Bands
Date : January 17, 2019 through February 7, 2019
Test Distance : 3 meters
Notes : Average Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
4874.00	H	40.6		3.7	36.7	-39.3	0.8	42.4	132.2	500.0	-11.6
4874.00	V	39.8		3.7	36.7	-39.3	0.8	41.6	120.6	500.0	-12.4
7311.00	H	34.60	Ambient	4.7	38.1	-39.4	0.8	38.8	86.8	500.0	-15.2
7311.00	V	34.5	Ambient	4.7	38.1	-39.4	0.8	38.7	85.9	500.0	-15.3
12185.00	H	35.3		6.1	41.8	-39.1	0.8	44.9	175.5	500.0	-9.1
12185.00	V	35.3	Ambient	6.1	41.8	-39.1	0.8	44.9	175.5	500.0	-9.1
19496.00	H	21.3		2.2	40.4	-28.8	0.8	35.9	62.4	500.0	-18.1
19496.00	V	23.0		2.2	40.4	-28.8	0.8	37.6	75.9	500.0	-16.4

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp + Duty Cycle

Checked By: MARK E. LONGINOTTI

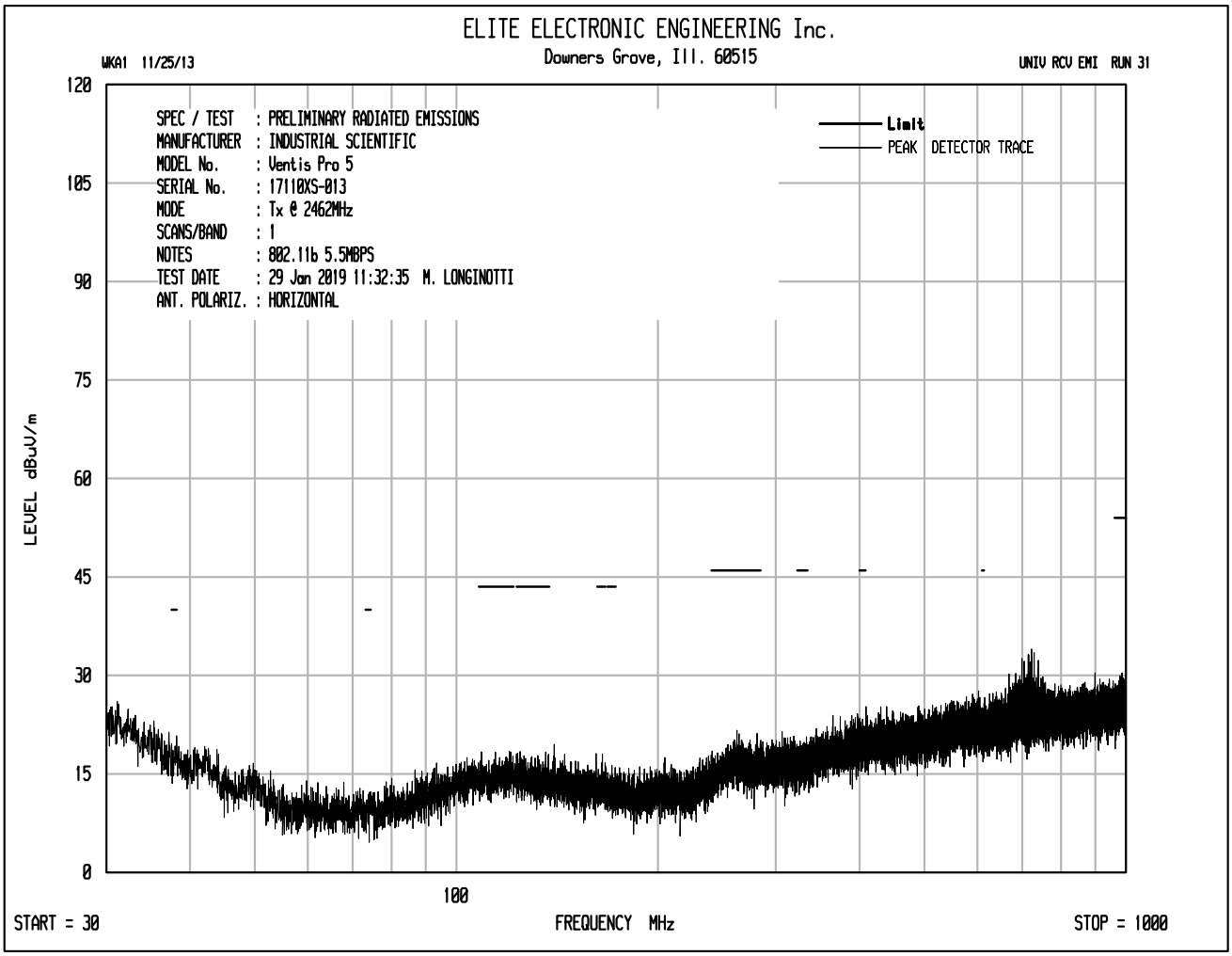
Mark E. Longinotti

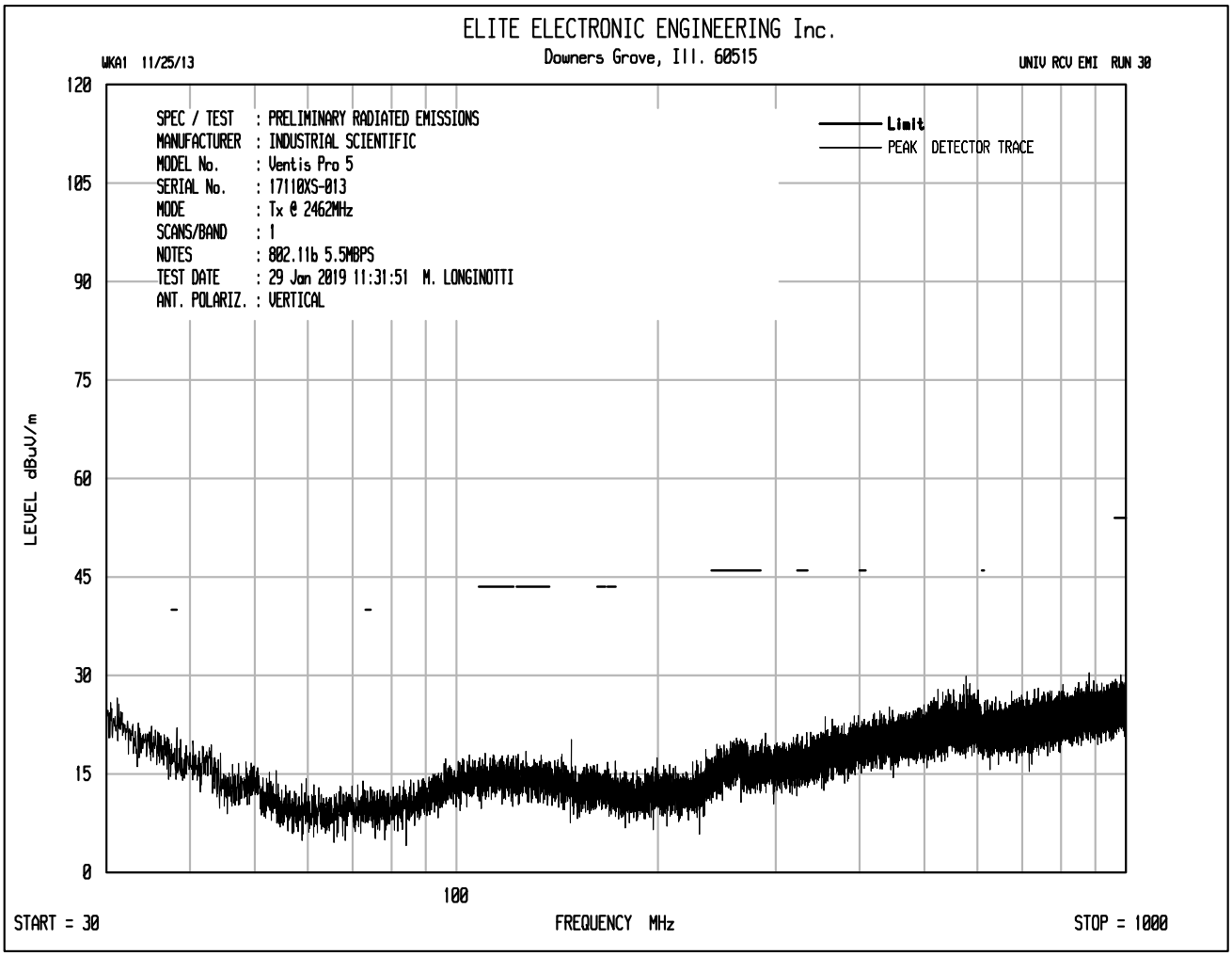
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 5
Serial No. : 18103FE-007 (18031ZW-005 for all but fundamental)
Mode : Transmit at 2437MHz, 802.11b, 5.5Mbps, power = 0
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions not in Restricted Bands
Date : January 17, 2019 through February 7, 2019
Test Distance : 3 meters
Notes : Peak Detector with 100kHz Resolution Bandwidth

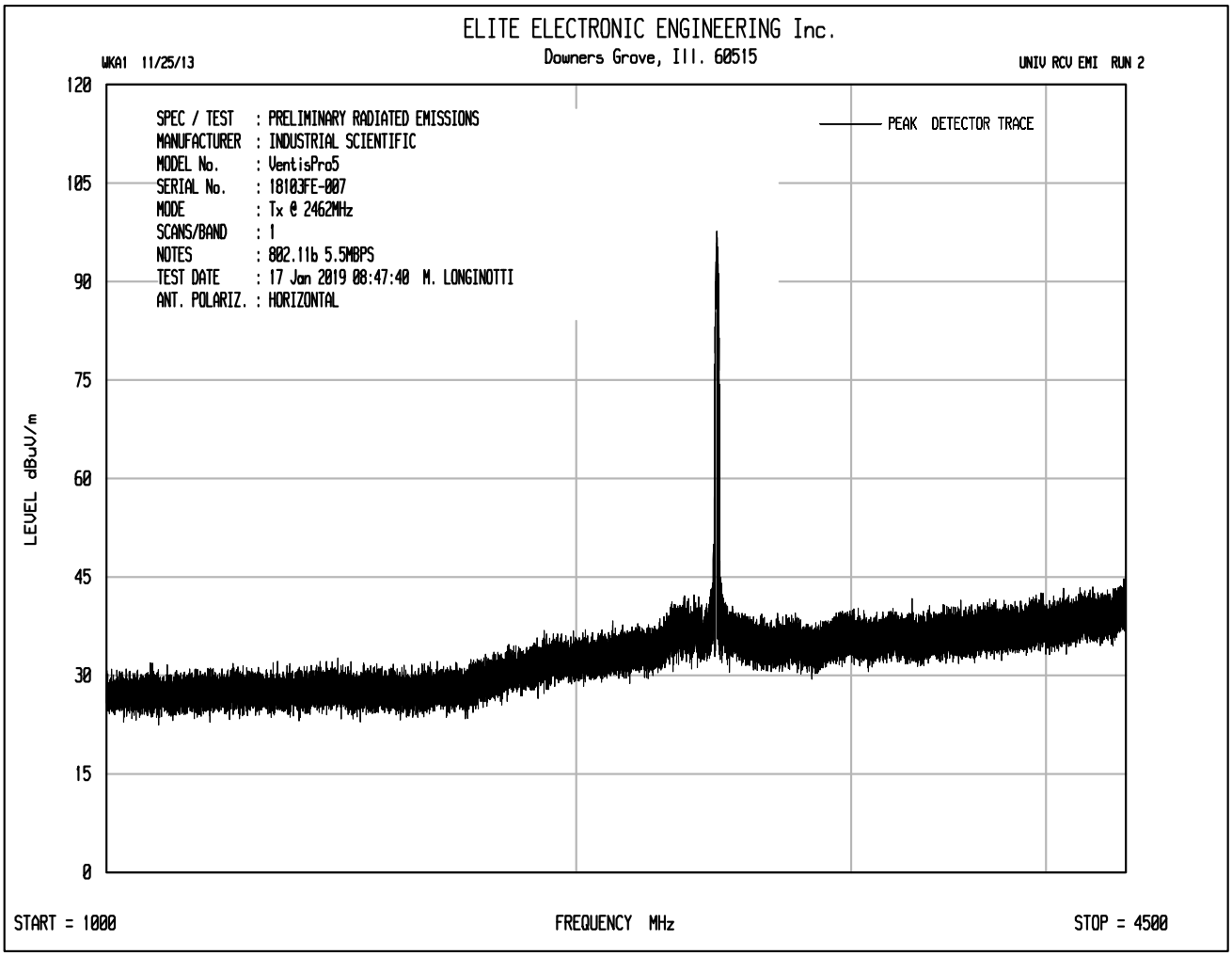
Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2437.00	H	63.4		2.6	33.6	0.0	99.6	95563.3		
2437.00	V	61.1		2.6	33.6	0.0	97.3	73331.6		
9748.00	H	40.0	Ambient	5.2	39.4	-39.3	45.3	184.7	9556.3	-34.3
9748.00	V	40.9	Ambient	5.2	39.4	-39.3	46.2	204.9	9556.3	-33.4
14622.00	H	39.4	Ambient	6.7	42.4	-38.2	50.2	324.5	9556.3	-29.4
14622.00	V	39.0	Ambient	6.7	42.4	-38.2	49.8	309.9	9556.3	-29.8
17059.00	H	39.6	Ambient	7.2	45.0	-37.5	54.4	521.9	9556.3	-25.3
17059.00	V	39.1	Ambient	7.2	45.0	-37.5	53.9	492.7	9556.3	-25.8
21933.00	H	24.1	Ambient	2.2	40.6	-29.4	37.5	75.2	9556.3	-42.1
21933.00	V	25.5	Ambient	2.2	40.6	-29.4	38.9	88.3	9556.3	-40.7
24370.00	H	25.6	Ambient	2.2	40.6	-30.4	38.1	80.3	9556.3	-41.5
24370.00	V	26.2	Ambient	2.2	40.6	-30.4	38.7	86.0	9556.3	-40.9
6498.68	H	56.3		4.4	37.8	-39.4	59.1	897.8	9556.3	-20.5
6498.68	V	50.2		4.4	37.8	-39.4	53.0	444.8	9556.3	-26.6

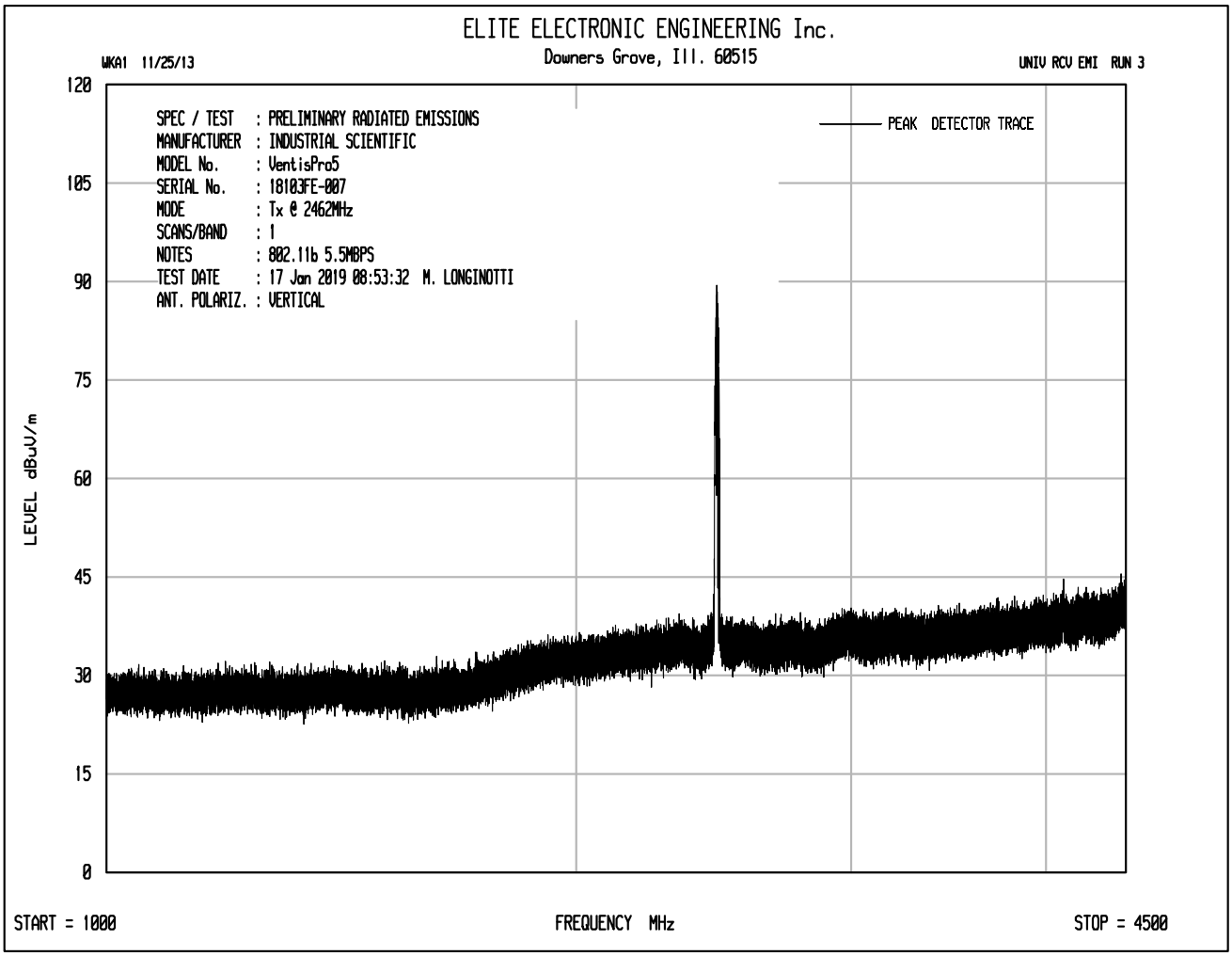
Checked By: MARK E. LONGINOTTI

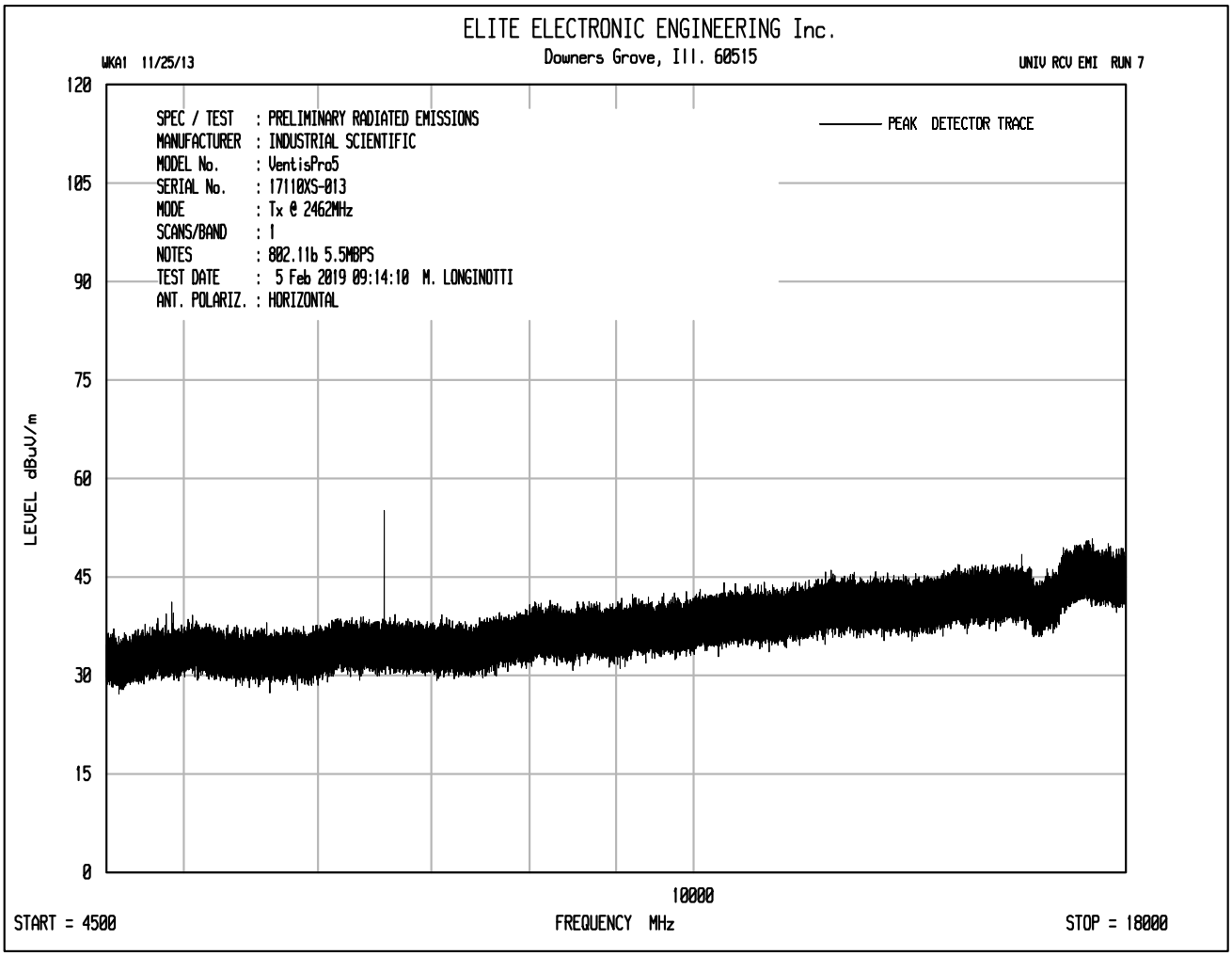
Mark E. Longinotti

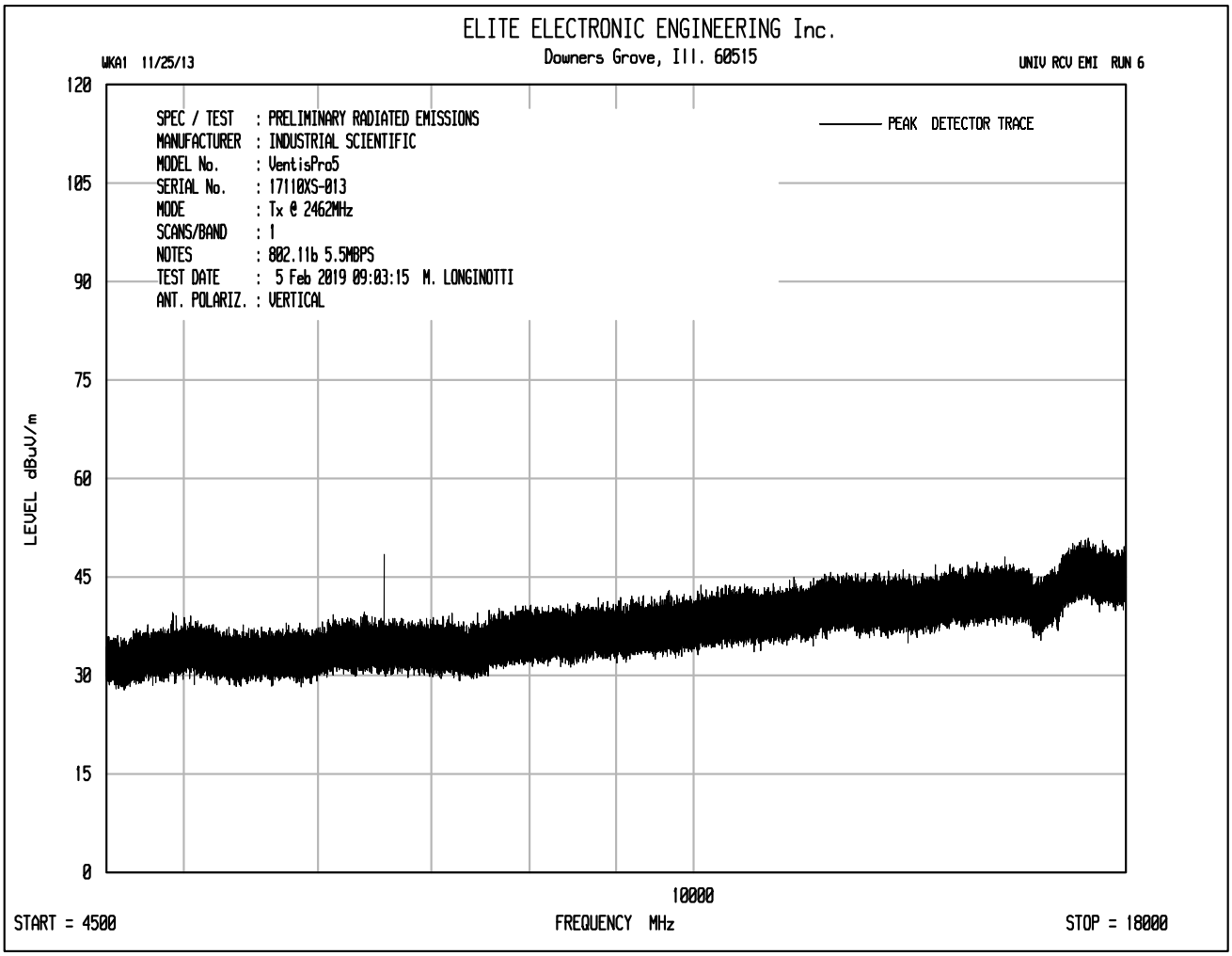

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 31
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : Ventis Pro 5
SERIAL No. : 17110XS-013
MODE : Tx @ 2462MHz
SCANS/BAND : 1
NOTES : 802.11b 5.5MBPS
TEST DATE : 29 Jan 2019 11:32:35 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

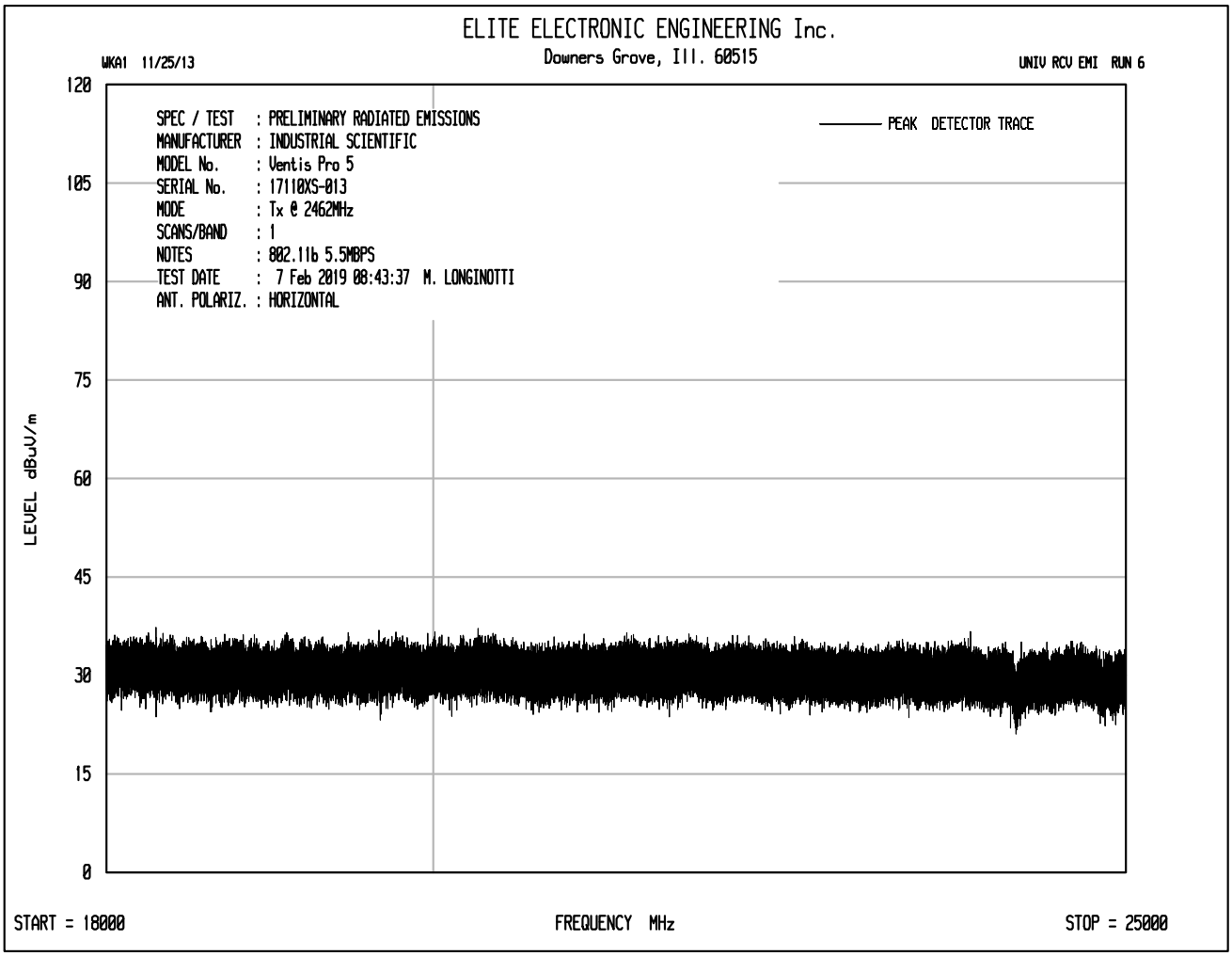

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 30
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : Ventis Pro 5
SERIAL No. : 17110XS-013
MODE : Tx @ 2462MHz
SCANS/BAND : 1
NOTES : 802.11b 5.5MBPS
TEST DATE : 29 Jan 2019 11:31:51 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

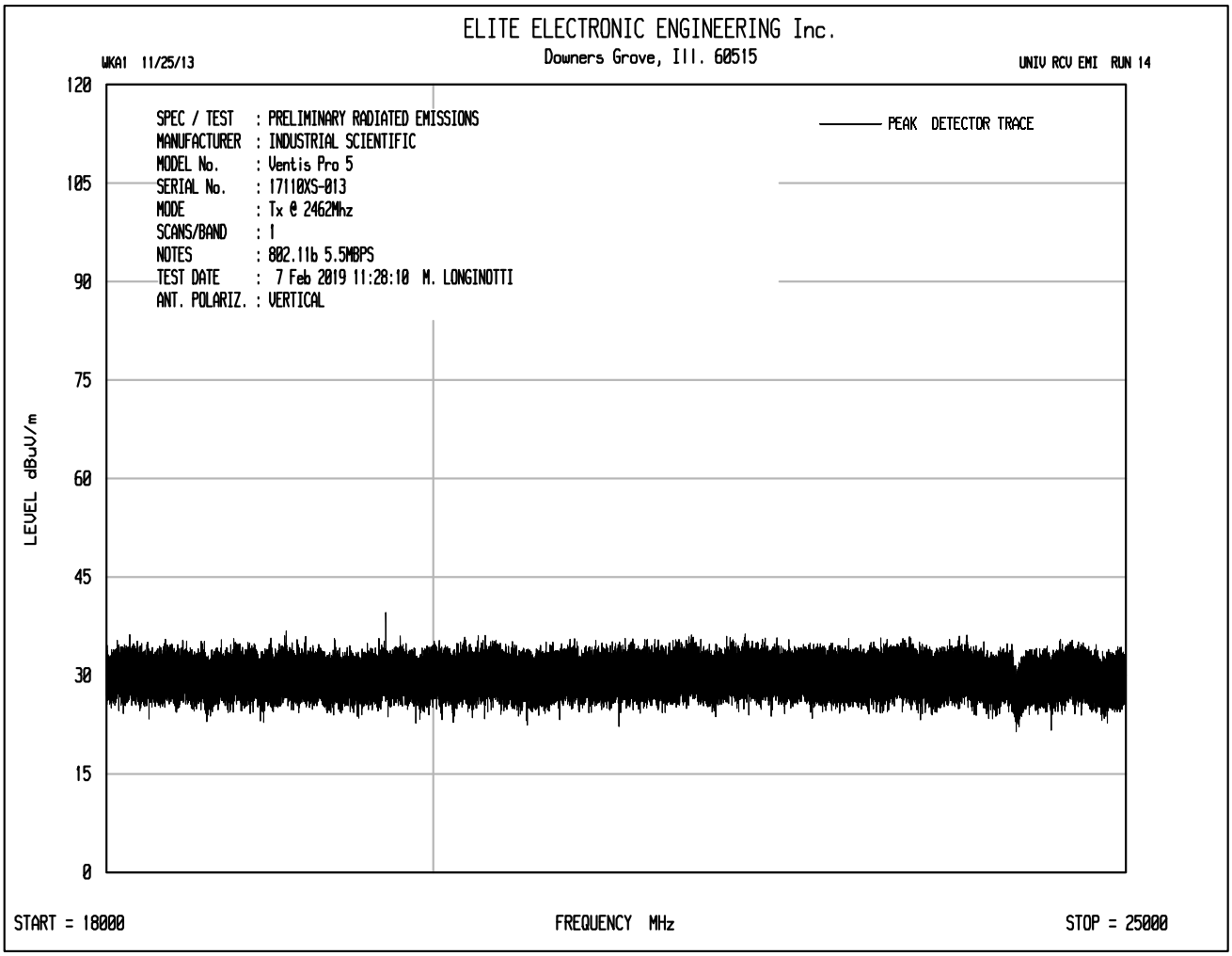

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 2
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : VentisPro5
SERIAL No. : 18103FE-007
MODE : Tx @ 2462MHz
SCANS/BAND : 1
NOTES : 802.11b 5.5MBPS
TEST DATE : 17 Jan 2019 08:47:40 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 3
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : VentisPro5
SERIAL No. : 18103FE-007
MODE : Tx @ 2462MHz
SCANS/BAND : 1
NOTES : 802.11b 5.5MBPS
TEST DATE : 17 Jan 2019 08:53:32 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 7
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : VentisPro5
SERIAL No. : 17110XS-013
MODE : Tx @ 2462MHz
SCANS/BAND : 1
NOTES : 802.11b 5.5MBPS
TEST DATE : 5 Feb 2019 09:14:10 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 6
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : VentisPro5
SERIAL No. : 17110XS-013
MODE : Tx @ 2462MHz
SCANS/BAND : 1
NOTES : 802.11b 5.5MBPS
TEST DATE : 5 Feb 2019 09:03:15 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 6
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : Ventis Pro 5
SERIAL No. : 17110XS-013
MODE : Tx @ 2462MHz
SCANS/BAND : 1
NOTES : 802.11b 5.5MBPS
TEST DATE : 7 Feb 2019 08:43:37 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 14
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : Ventis Pro 5
SERIAL No. : 17110XS-013
MODE : Tx @ 2462Mhz
SCANS/BAND : 1
NOTES : 802.11b 5.5MBPS
TEST DATE : 7 Feb 2019 11:28:10 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 5
Serial No. : 17110XS-013
Mode : Transmit at 2462MHz, 802.11b, 5.5Mbps, power = 0
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : January 17, 2019 through February 7, 2019
Test Distance : 3 meters
Notes : Peak Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
4924.00	H	52.4		3.7	36.8	-39.3	53.6	477.5	5000.0	-20.4
4924.00	V	51.2		3.7	36.8	-39.3	52.4	415.9	5000.0	-21.6
7386.00	H	48.2	Ambient	4.7	38.1	-39.4	51.6	381.6	5000.0	-22.3
7386.00	V	48.6	Ambient	4.7	38.1	-39.4	52.0	399.6	5000.0	-21.9
12310.00	H	50.0	Ambient	6.1	41.7	-39.0	58.8	866.6	5000.0	-15.2
12310.00	V	49.6	Ambient	6.1	41.7	-39.0	58.4	827.6	5000.0	-15.6
19696.00	H	35.3	Ambient	2.2	40.4	-28.5	49.4	296.7	5000.0	-24.5
19696.00	V	34.5	Ambient	2.2	40.4	-28.5	48.6	270.5	5000.0	-25.3
22158.00	H	34.8	Ambient	2.2	40.6	-29.3	48.3	260.0	5000.0	-25.7
22158.00	V	35.1	Ambient	2.2	40.6	-29.3	48.6	269.1	5000.0	-25.4

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked By: MARK E. LONGINOTTI

Mark E. Longinotti

Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 5
Serial No. : 17110XS-013
Mode : Transmit at 2462MHz, 802.11b, 5.5Mbps, power = 0
Test Specification : FCC-15.247, RSS-247 Average Radiated Emissions in Restricted Bands
Date : January 17, 2019 through February 7, 2019
Test Distance : 3 meters
Notes : Average Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
4924.00	H	39.1		3.7	36.8	-39.3	0.8	41.1	113.2	500.0	-12.9
4924.00	V	38.2		3.7	36.8	-39.3	0.8	40.2	102.1	500.0	-13.8
7386.00	H	34.00	Ambient	4.7	38.1	-39.4	0.8	38.2	81.6	500.0	-15.7
7386.00	V	34.0	Ambient	4.7	38.1	-39.4	0.8	38.2	81.6	500.0	-15.7
12310.00	H	35.0	Ambient	6.1	41.7	-39.0	0.8	44.6	169.0	500.0	-9.4
12310.00	V	34.9	Ambient	6.1	41.7	-39.0	0.8	44.5	167.0	500.0	-9.5
19696.00	H	20.7	Ambient	2.2	40.4	-28.5	0.8	35.6	60.6	500.0	-18.3
19696.00	V	23.1	Ambient	2.2	40.4	-28.5	0.8	38.0	79.8	500.0	-15.9
22158.00	H	20.5	Ambient	2.2	40.6	-29.3	0.8	34.8	55.0	500.0	-19.2
22158.00	V	24.4	Ambient	2.2	40.6	-29.3	0.8	38.7	86.1	500.0	-15.3

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp + Duty Cycle

Checked By: MARK E. LONGINOTTI

Mark E. Longinotti

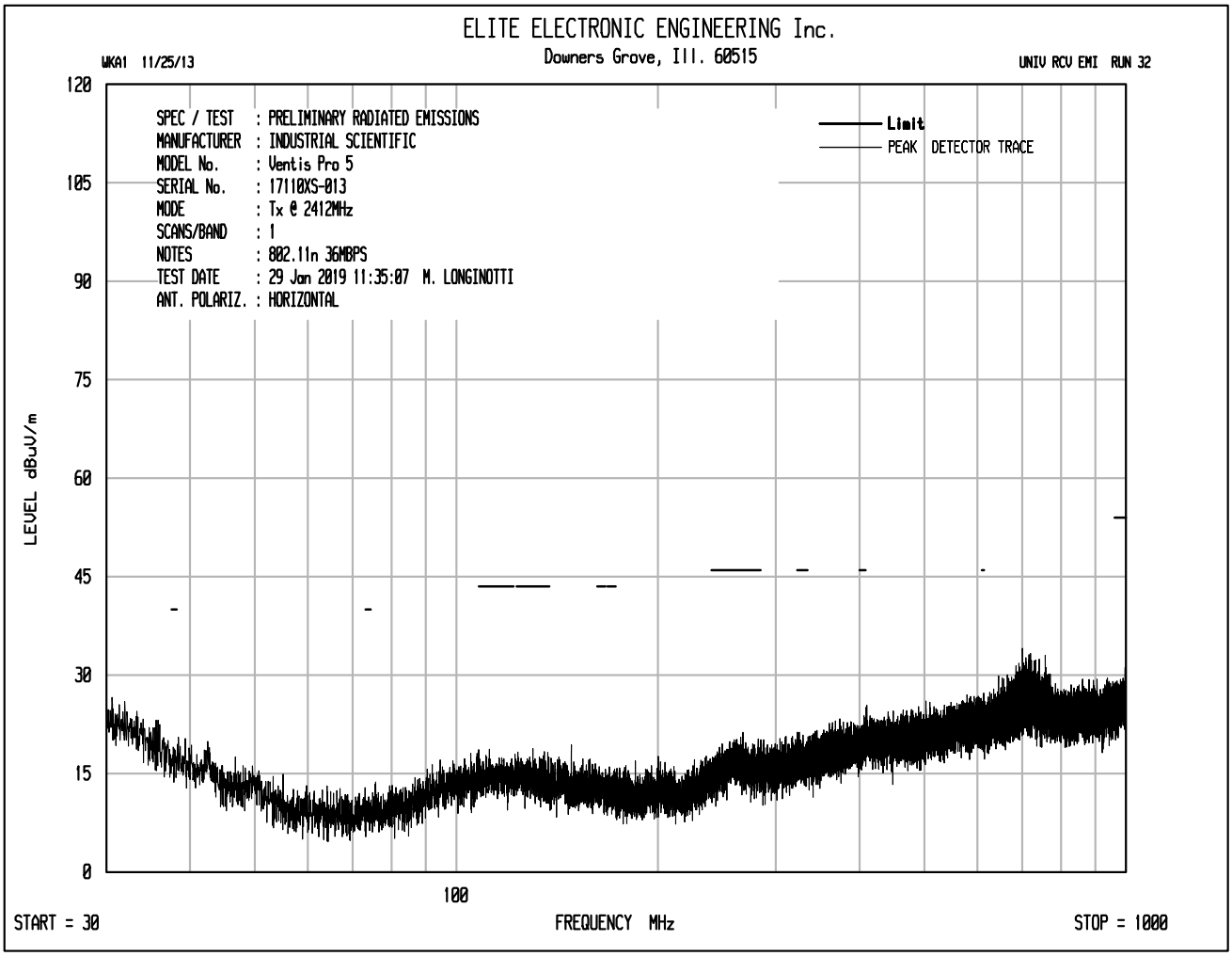
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 5
Serial No. : 18103FE-007 (17110XS-013 for all but fundamental)
Mode : Transmit at 2462MHz, 802.11b, 5.5Mbps, power = 0
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions not in Restricted Bands
Date : January 17, 2019 through February 7, 2019
Test Distance : 3 meters
Notes : Peak Detector with 100kHz Resolution Bandwidth

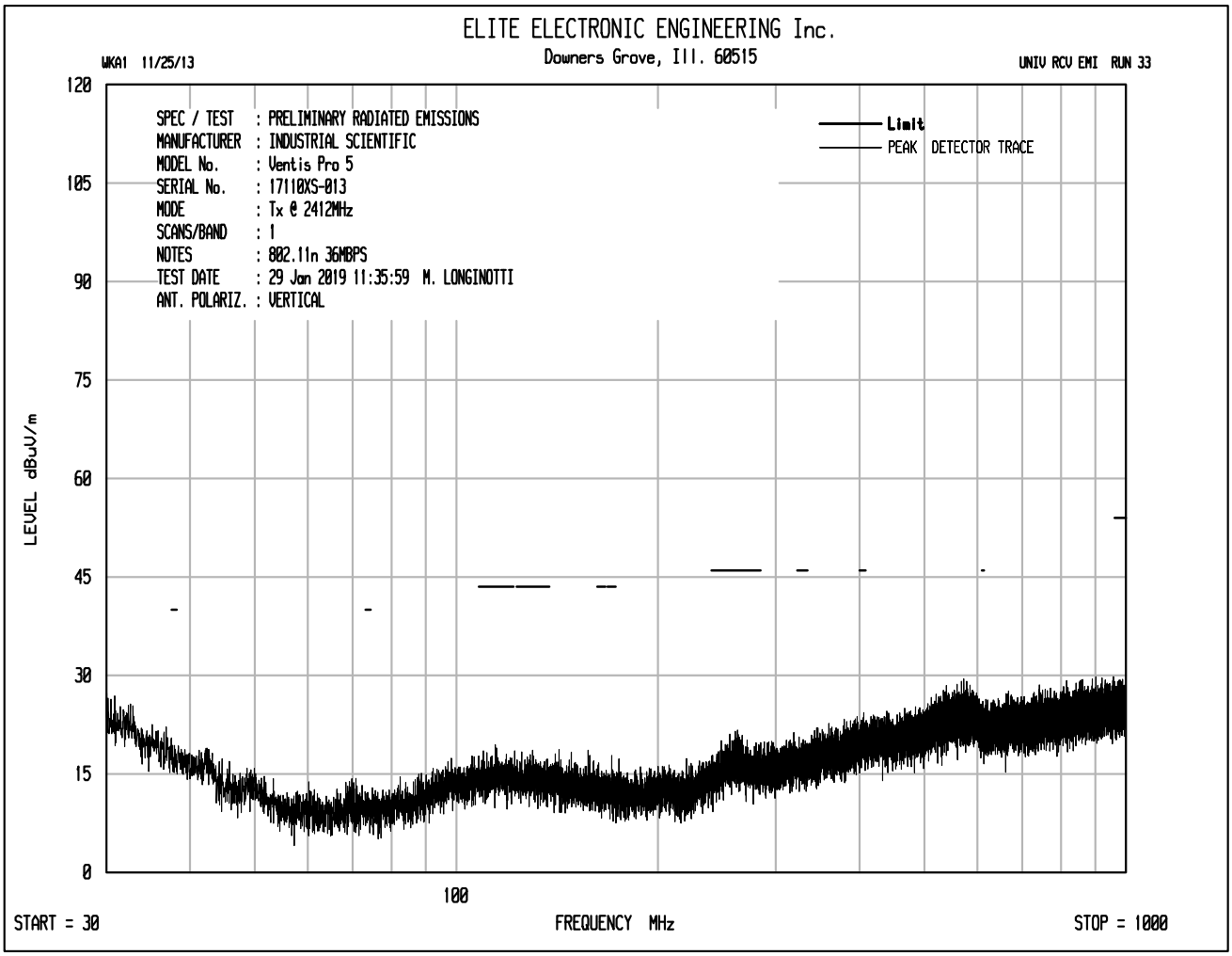
Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2462.00	H	63.1		2.6	33.6	0.0	99.3	92666.3		
2462.00	V	55.0		2.6	33.6	0.0	91.2	36468.8		
9848.00	H	40.2	Ambient	5.3	39.5	-39.2	45.8	194.2	9266.6	-33.6
9848.00	V	40.0	Ambient	5.3	39.5	-39.2	45.6	189.8	9266.6	-33.8
14772.00	H	38.7	Ambient	6.8	42.6	-38.2	49.9	311.5	9266.6	-29.5
14772.00	V	39.1	Ambient	6.8	42.6	-38.2	50.3	326.2	9266.6	-29.1
17234.00	H	39.7	Ambient	7.3	44.6	-37.7	54.0	500.1	9266.6	-25.4
17234.00	V	39.4	Ambient	7.3	44.6	-37.7	53.7	483.1	9266.6	-25.7
24620.00	H	24.8	Ambient	2.2	40.6	-30.7	36.9	70.3	9266.6	-42.4
24620.00	V	24.7	Ambient	2.2	40.6	-30.7	36.8	69.5	9266.6	-42.5
6565.36	H	51.1		4.4	38.1	-39.4	54.2	510.6	9266.6	-25.2
6565.36	V	51.9		4.4	38.1	-39.4	55.0	559.9	9266.6	-24.4

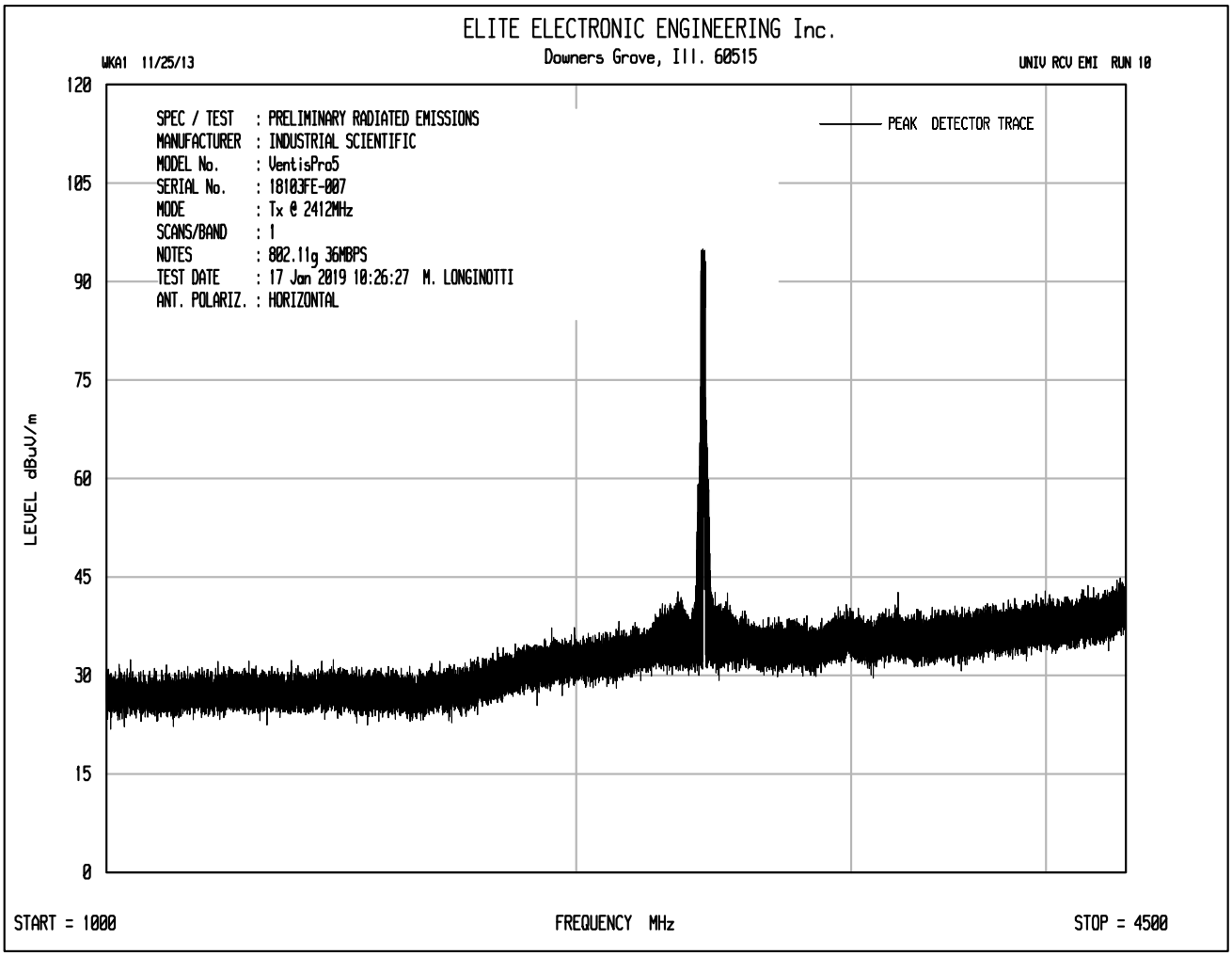
Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

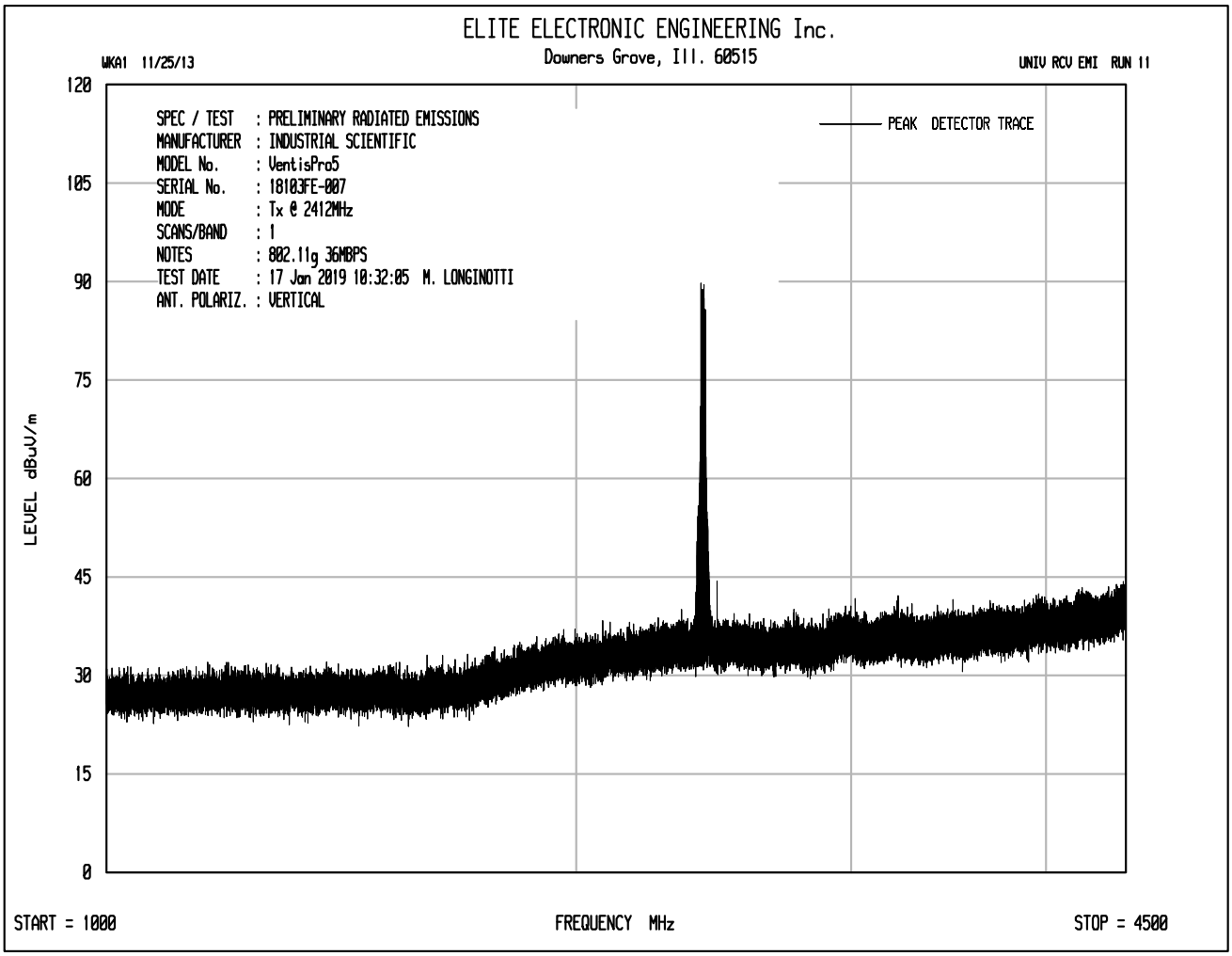
Checked By: MARK E. LONGINOTTI

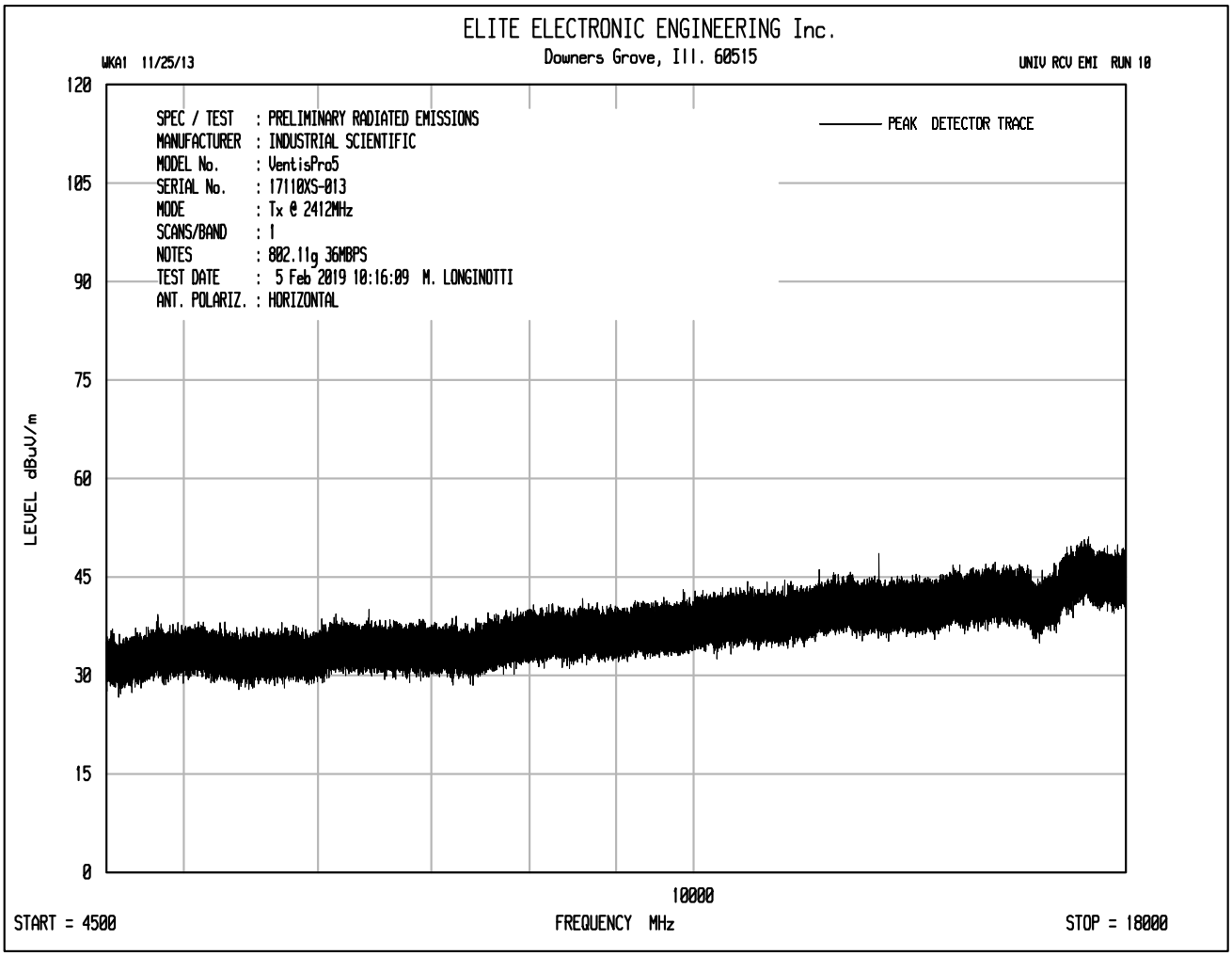
Mark E. Longinotti

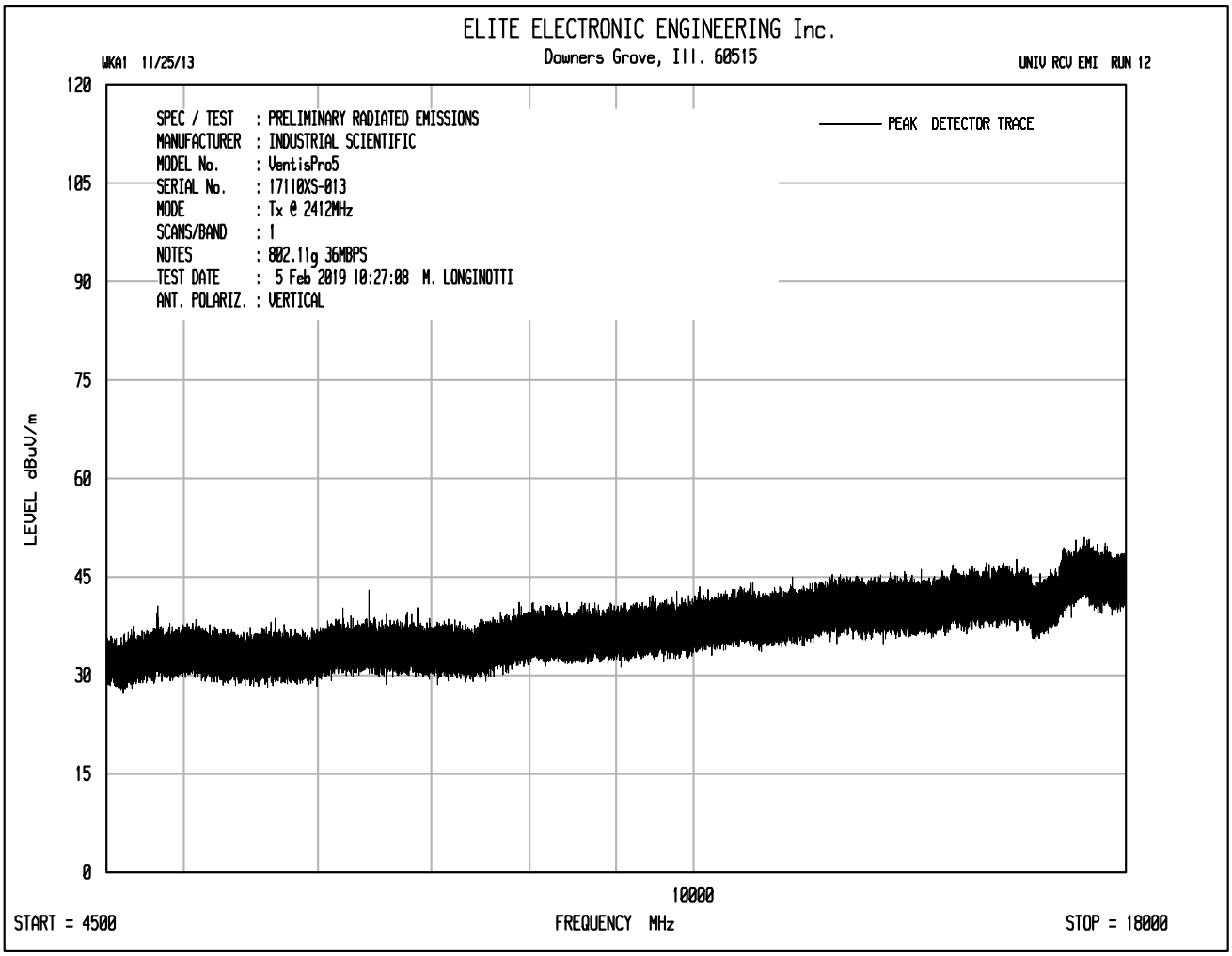

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 32
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : Ventis Pro 5
SERIAL No. : 17110XS-013
MODE : Tx @ 2412MHz
SCANS/BAND : 1
NOTES : 802.11n 36MBPS
TEST DATE : 29 Jan 2019 11:35:07 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

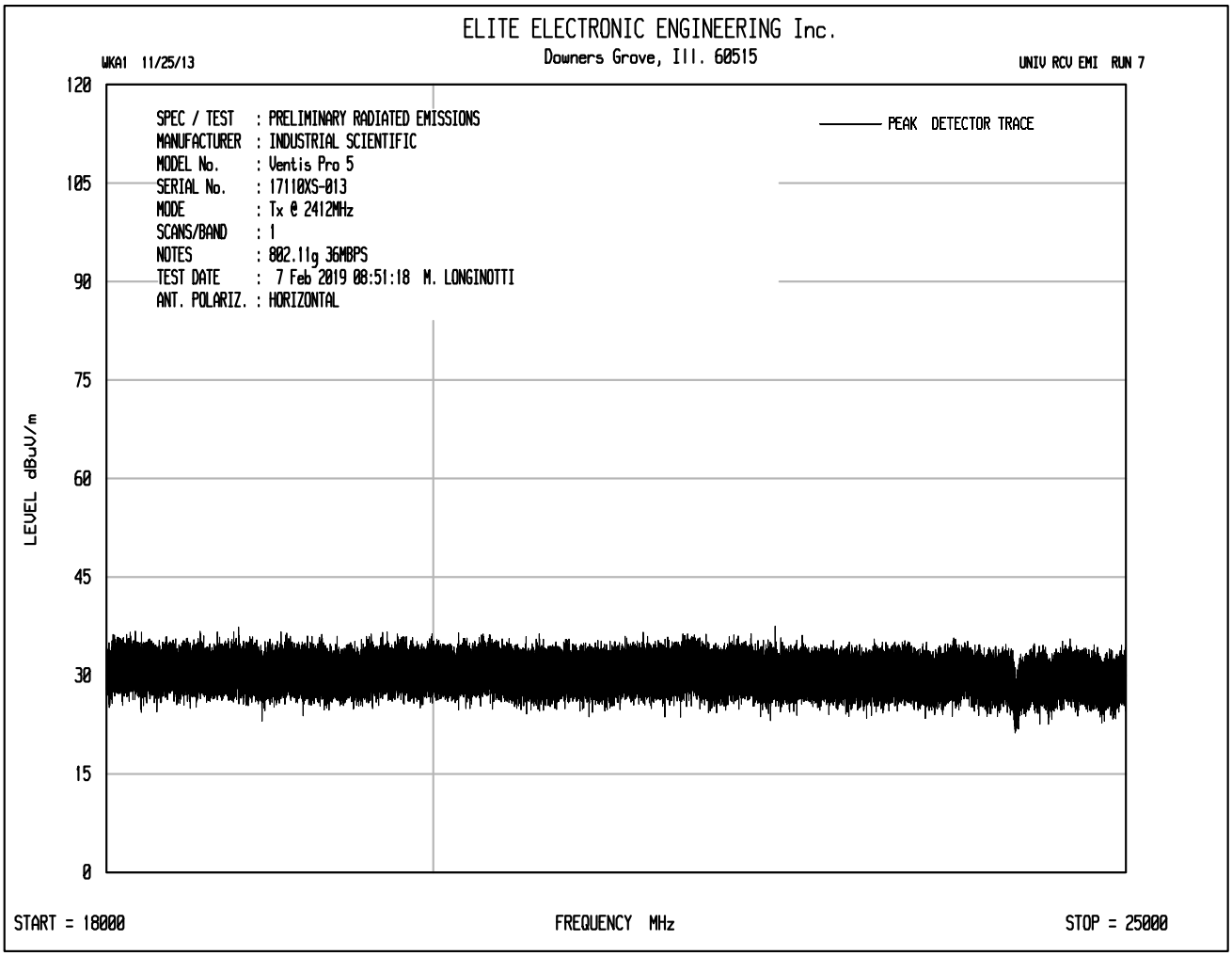

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 33
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : Ventis Pro 5
SERIAL No. : 17110XS-013
MODE : Tx @ 2412MHz
SCANS/BAND : 1
NOTES : 802.11n 36MBPS
TEST DATE : 29 Jan 2019 11:35:59 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

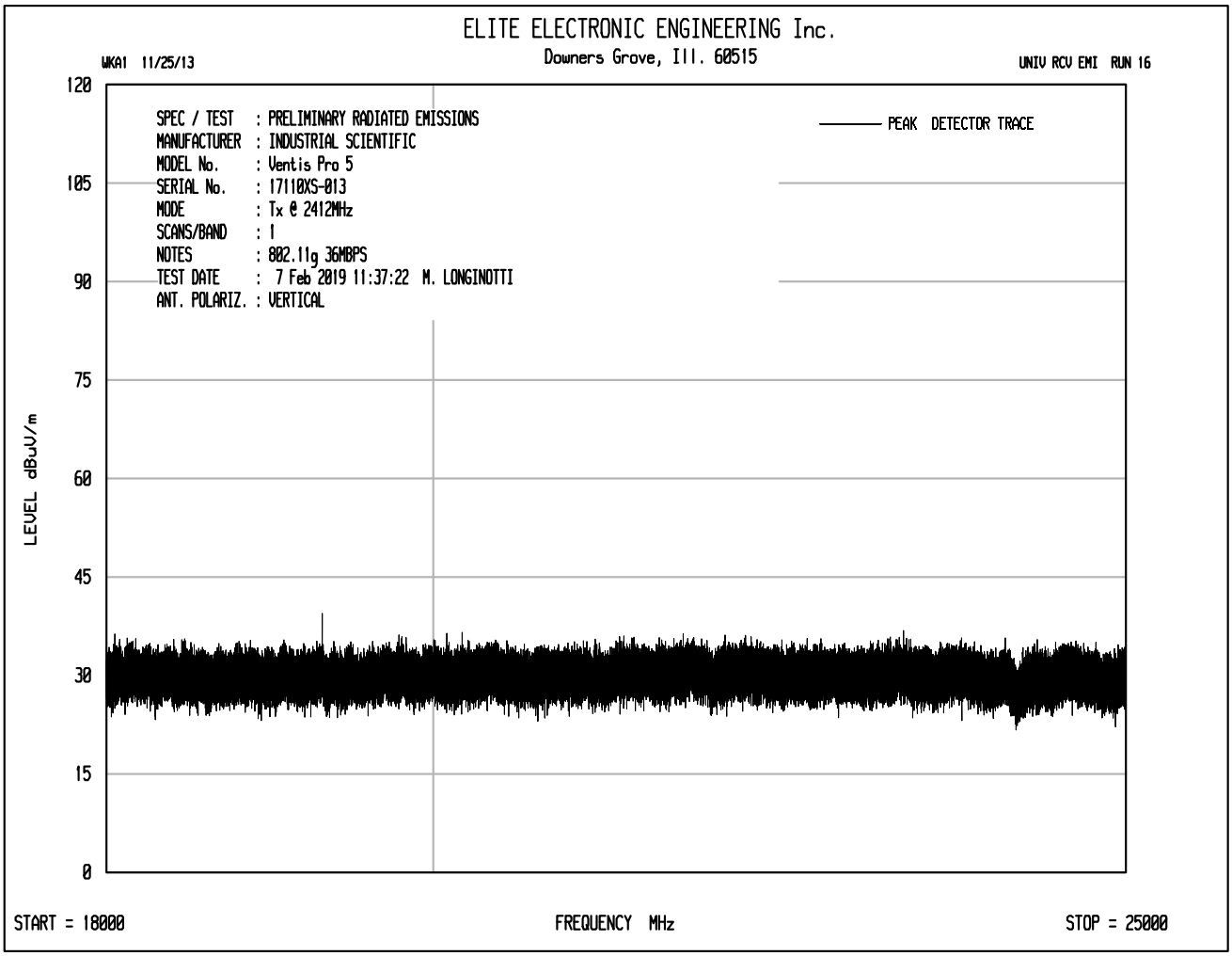

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : VentisPro5
SERIAL No. : 18103FE-007
MODE : Tx @ 2412MHz
SCANS/BAND : 1
NOTES : 802.11g 36MBPS
TEST DATE : 17 Jan 2019 10:26:27 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 11
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : VentisPro5
SERIAL No. : 18103FE-007
MODE : Tx @ 2412MHz
SCANS/BAND : 1
NOTES : 802.11g 36MBPS
TEST DATE : 17 Jan 2019 10:32:05 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : VentisPro5
SERIAL No. : 17110XS-013
MODE : Tx @ 2412MHz
SCANS/BAND : 1
NOTES : 802.11g 36MBPS
TEST DATE : 5 Feb 2019 10:16:09 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 12
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : VentisPro5
SERIAL No. : 17110XS-013
MODE : Tx @ 2412MHz
SCANS/BAND : 1
NOTES : 802.11g 36MBPS
TEST DATE : 5 Feb 2019 10:27:08 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 7
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : Ventis Pro 5
SERIAL No. : 17110XS-013
MODE : Tx @ 2412MHz
SCANS/BAND : 1
NOTES : 802.11g 36MBPS
TEST DATE : 7 Feb 2019 08:51:18 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 16
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : Ventis Pro 5
SERIAL No. : 17110XS-013
MODE : Tx @ 2412MHz
SCANS/BAND : 1
NOTES : 802.11g 36MBPS
TEST DATE : 7 Feb 2019 11:37:22 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 5
Serial No. : 17110XS-013
Mode : Transmit at 2412MHz, 802.11g, 36Mbps, power = 0
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : January 17, 2019 through February 7, 2019
Test Distance : 3 meters
Notes : Peak Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
4824.00	H	49.5	Ambient	3.7	36.8	-39.3	50.6	340.3	5000.0	-23.3
4824.00	V	52.8		3.7	36.8	-39.3	53.9	497.6	5000.0	-20.0
12060.00	H	50.3	Ambient	6.1	41.8	-39.1	59.0	893.3	5000.0	-15.0
12060.00	V	50.3	Ambient	6.1	41.8	-39.1	59.0	893.3	5000.0	-15.0
14472.00	H	48.8	Ambient	6.6	42.1	-38.3	59.3	920.9	5000.0	-14.7
14472.00	V	48.8	Ambient	6.6	42.1	-38.3	59.3	920.9	5000.0	-14.7
19296.00	H	34.9	Ambient	2.2	40.4	-28.5	49.0	280.4	5000.0	-25.0
19296.00	V	35.0	Ambient	2.2	40.4	-28.5	49.1	283.7	5000.0	-24.9

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked By: MARK E. LONGINOTTI

Mark E. Longinotti

Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 5
Serial No. : 17110XS-013
Mode : Transmit at 2412MHz, 802.11g, 36Mbps, power = 0
Test Specification : FCC-15.247, RSS-247 Average Radiated Emissions in Restricted Bands
Date : January 17, 2019 through February 7, 2019
Test Distance : 3 meters
Notes : Average Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
4824.00	H	35.8	Ambient	3.7	36.8	-39.3	6.6	43.5	150.3	500.0	-10.4
4824.00	V	37.0		3.7	36.8	-39.3	6.6	44.7	172.5	500.0	-9.2
12060.00	H	35.4	Ambient	6.1	41.8	-39.1	6.6	50.7	343.6	500.0	-3.3
12060.00	V	35.4	Ambient	6.1	41.8	-39.1	6.6	50.7	343.6	500.0	-3.3
14472.00	H	34.1	Ambient	6.6	42.1	-38.3	6.6	51.2	362.4	500.0	-2.8
14472.00	V	34.1	Ambient	6.6	42.1	-38.3	6.6	51.2	362.4	500.0	-2.8
19296.00	H	21.3	Ambient	2.2	40.4	-28.5	6.6	42.0	125.3	500.0	-12.0
19296.00	V	22.1	Ambient	2.2	40.4	-28.5	6.6	42.8	137.4	500.0	-11.2

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp + Duty Cycle

Checked By: MARK E. LONGINOTTI

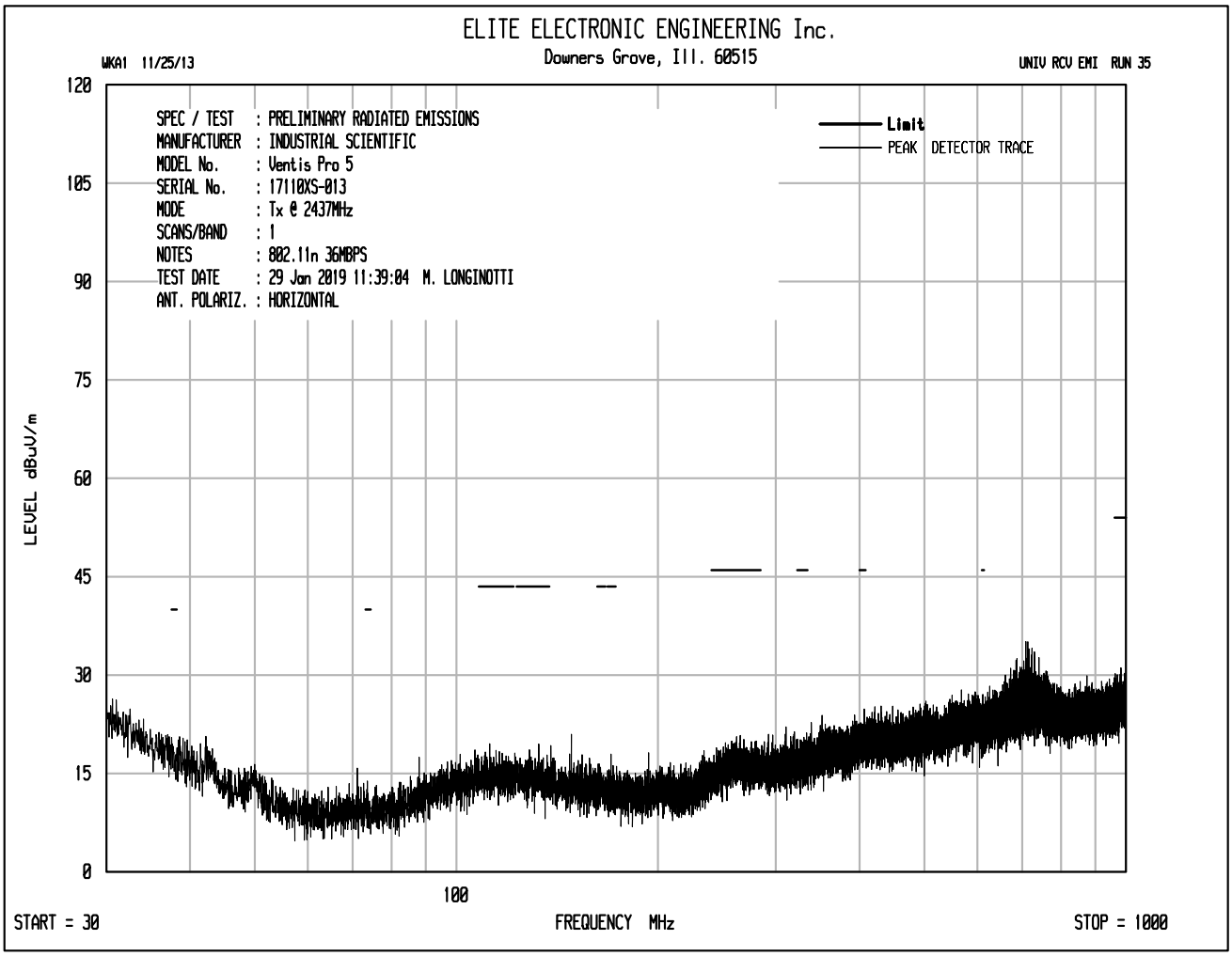
Mark E. Longinotti

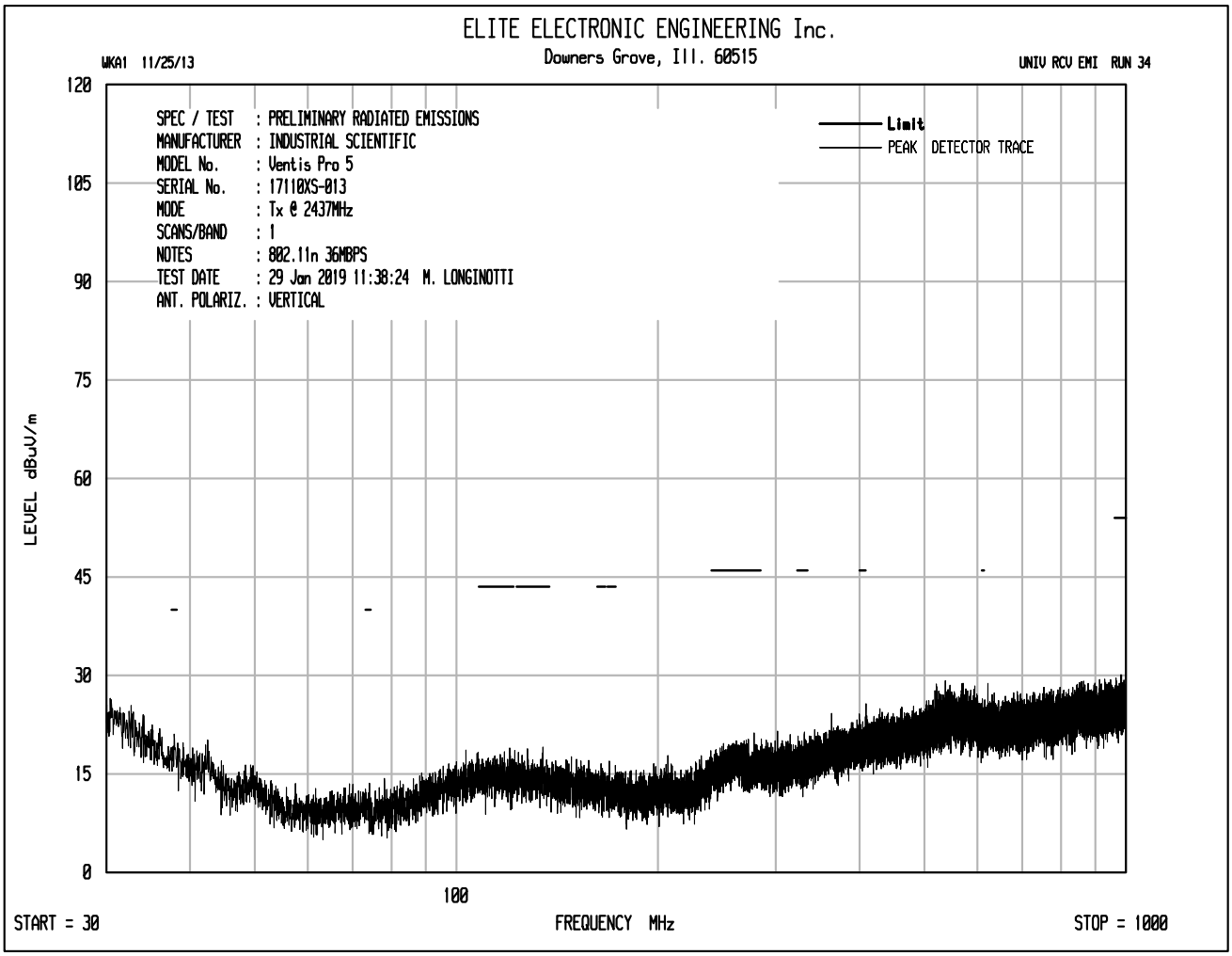
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 5
Serial No. : 18103FE-007 (17110XS-013 for all but fundamental)
Mode : Transmit at 2412MHz, 802.11g, 36Mbps, power = 0
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions not in Restricted Bands
Date : January 17, 2019 through February 7, 2019
Test Distance : 3 meters
Notes : Peak Detector with 100kHz Resolution Bandwidth

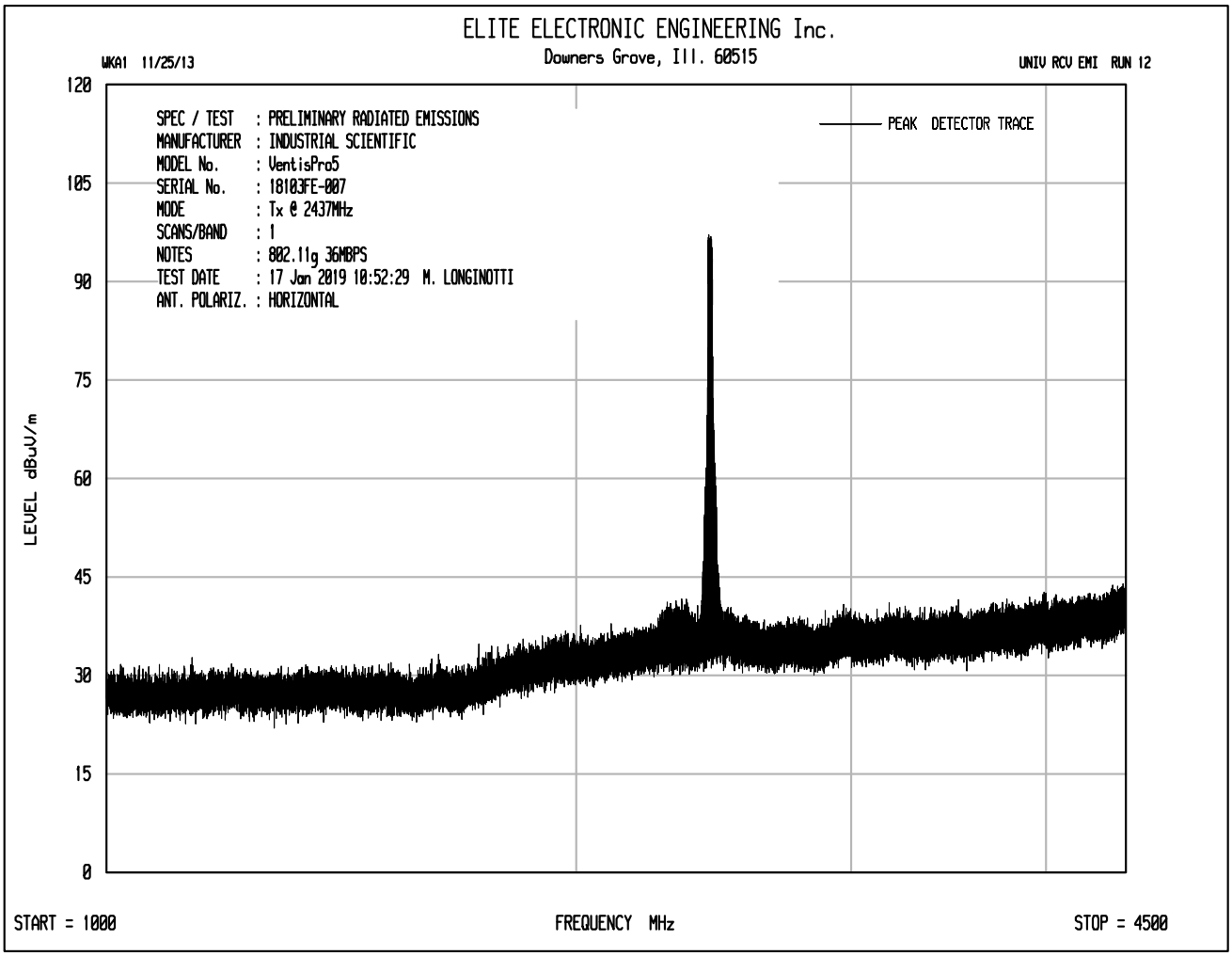
Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2412.00	H	61.2		2.6	33.6	0.0	97.4	74317.8		
2412.00	V	55.3		2.6	33.6	0.0	91.5	37678.4		
7236.00	H	38.7	Ambient	4.7	38.1	-39.4	42.0	126.5	7431.8	-35.4
7236.00	V	41.2		4.7	38.1	-39.4	44.5	168.7	7431.8	-32.9
9648.00	H	39.9	Ambient	5.2	39.2	-39.3	45.0	178.2	7431.8	-32.4
9648.00	V	41.5	Ambient	5.2	39.2	-39.3	46.6	214.2	7431.8	-30.8
16884.00	H	38.6	Ambient	7.2	45.1	-37.5	53.4	466.6	7431.8	-24.0
16884.00	V	38.6	Ambient	7.2	45.1	-37.5	53.4	466.6	7431.8	-24.0
21708.00	H	24.6	Ambient	2.2	40.6	-28.9	38.5	84.3	7431.8	-38.9
21708.00	V	24.1	Ambient	2.2	40.6	-28.9	38.0	79.6	7431.8	-39.4
24120.00	H	21.9	Ambient	2.2	40.6	-30.5	34.3	51.6	7431.8	-43.2
24120.00	V	22.8	Ambient	2.2	40.6	-30.5	35.2	57.3	7431.8	-42.3
6432.02	H	53.4		4.3	37.9	-39.4	56.2	645.2	7431.8	-21.2
6432.02	V	50.1		4.3	37.9	-39.4	52.9	441.3	7431.8	-24.5

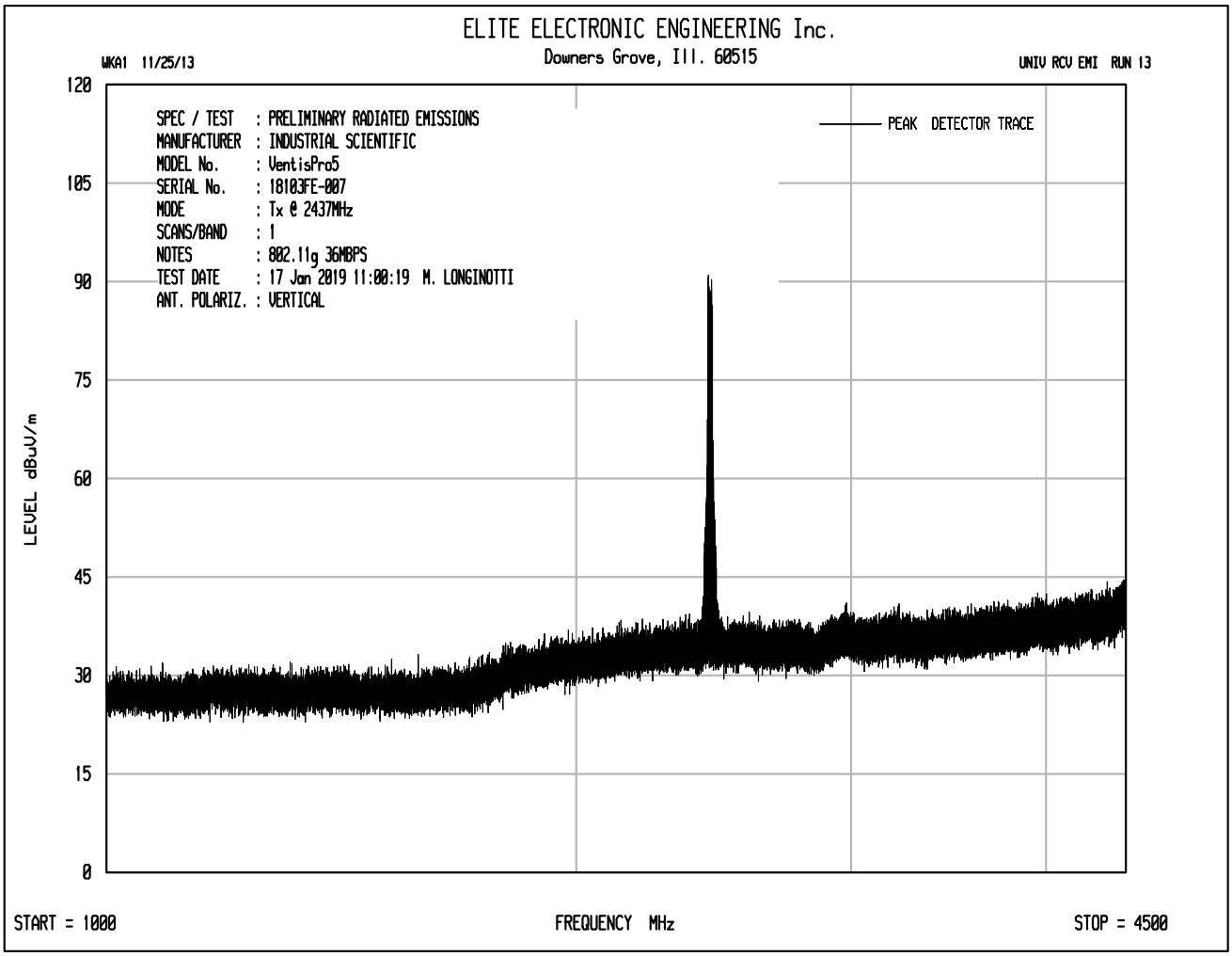
Checked By: MARK E. LONGINOTTI

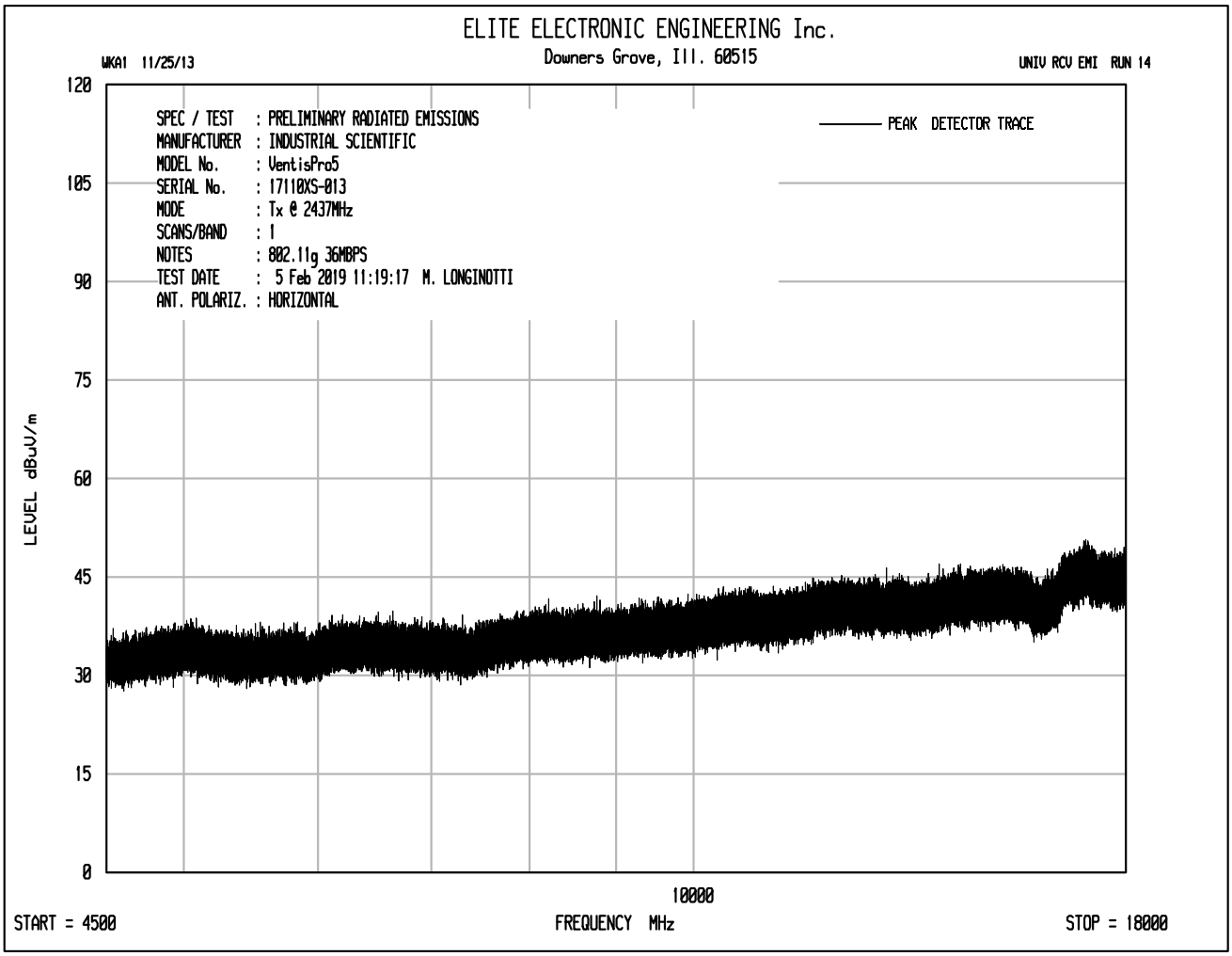
Mark E. Longinotti

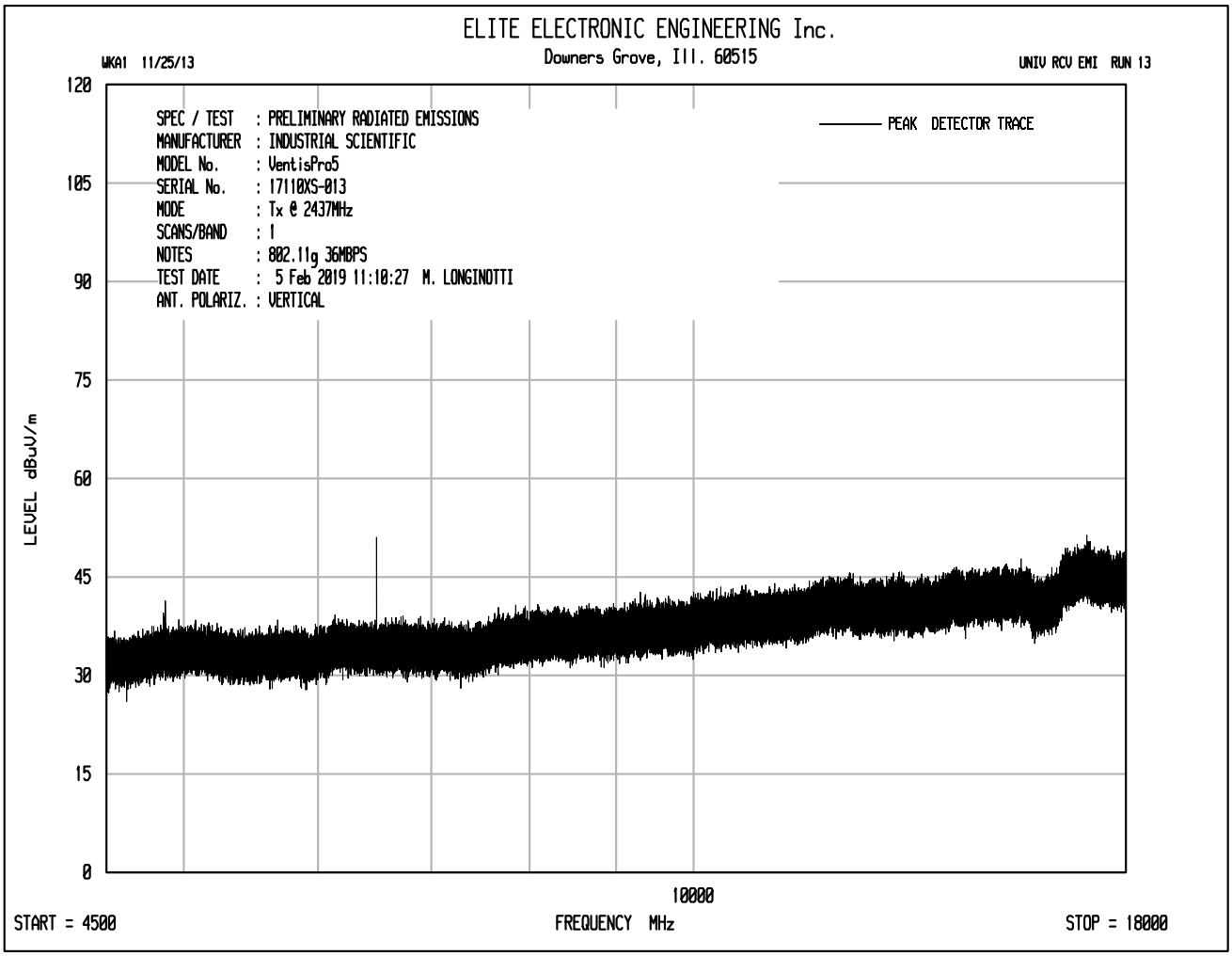

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 35
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : Ventis Pro 5
SERIAL No. : 17110XS-013
MODE : Tx @ 2437MHz
SCANS/BAND : 1
NOTES : 802.11n 36MBPS
TEST DATE : 29 Jan 2019 11:39:04 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

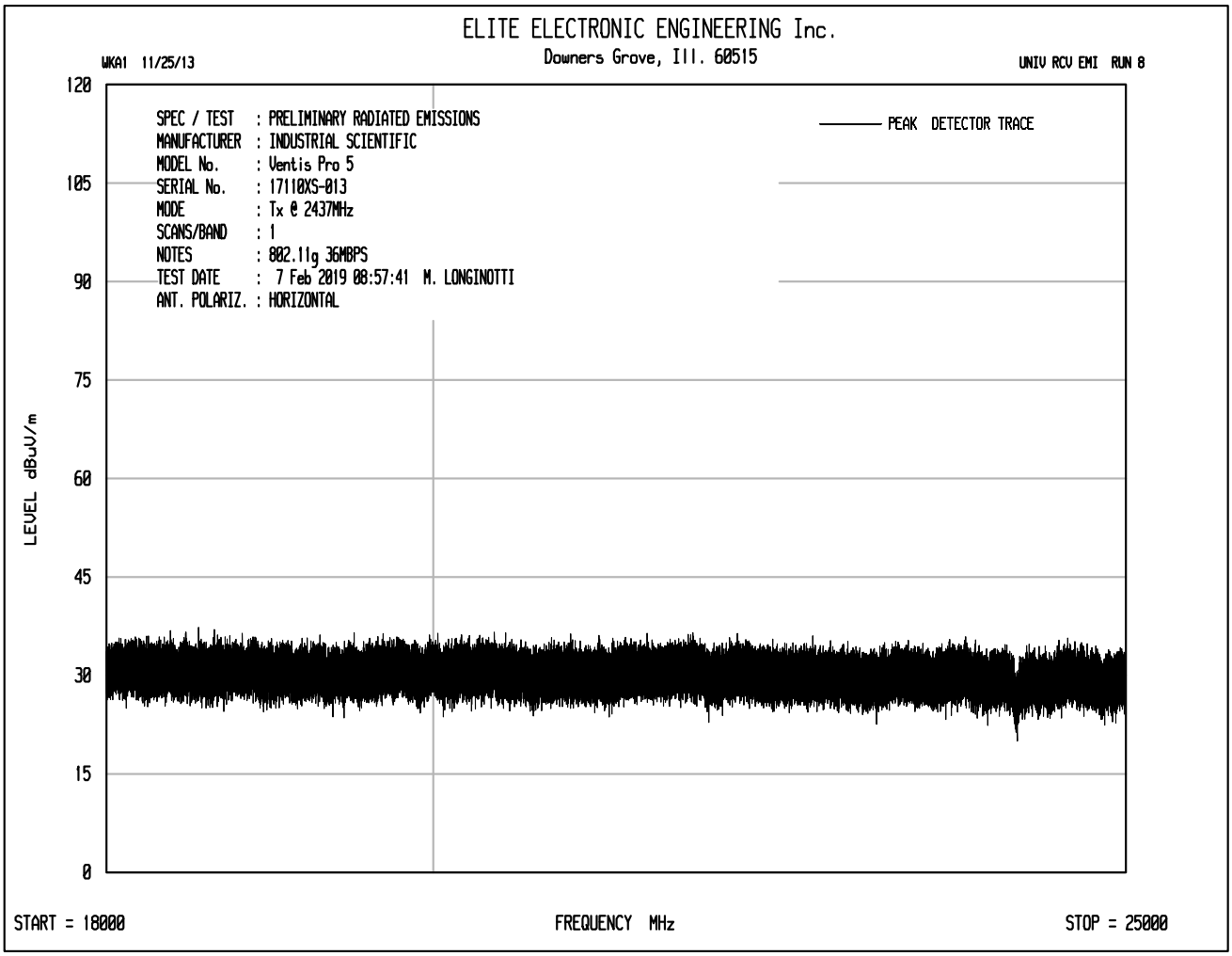

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 34
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : Ventis Pro 5
SERIAL No. : 17110XS-013
MODE : Tx @ 2437MHz
SCANS/BAND : 1
NOTES : 802.11n 36MBPS
TEST DATE : 29 Jan 2019 11:38:24 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

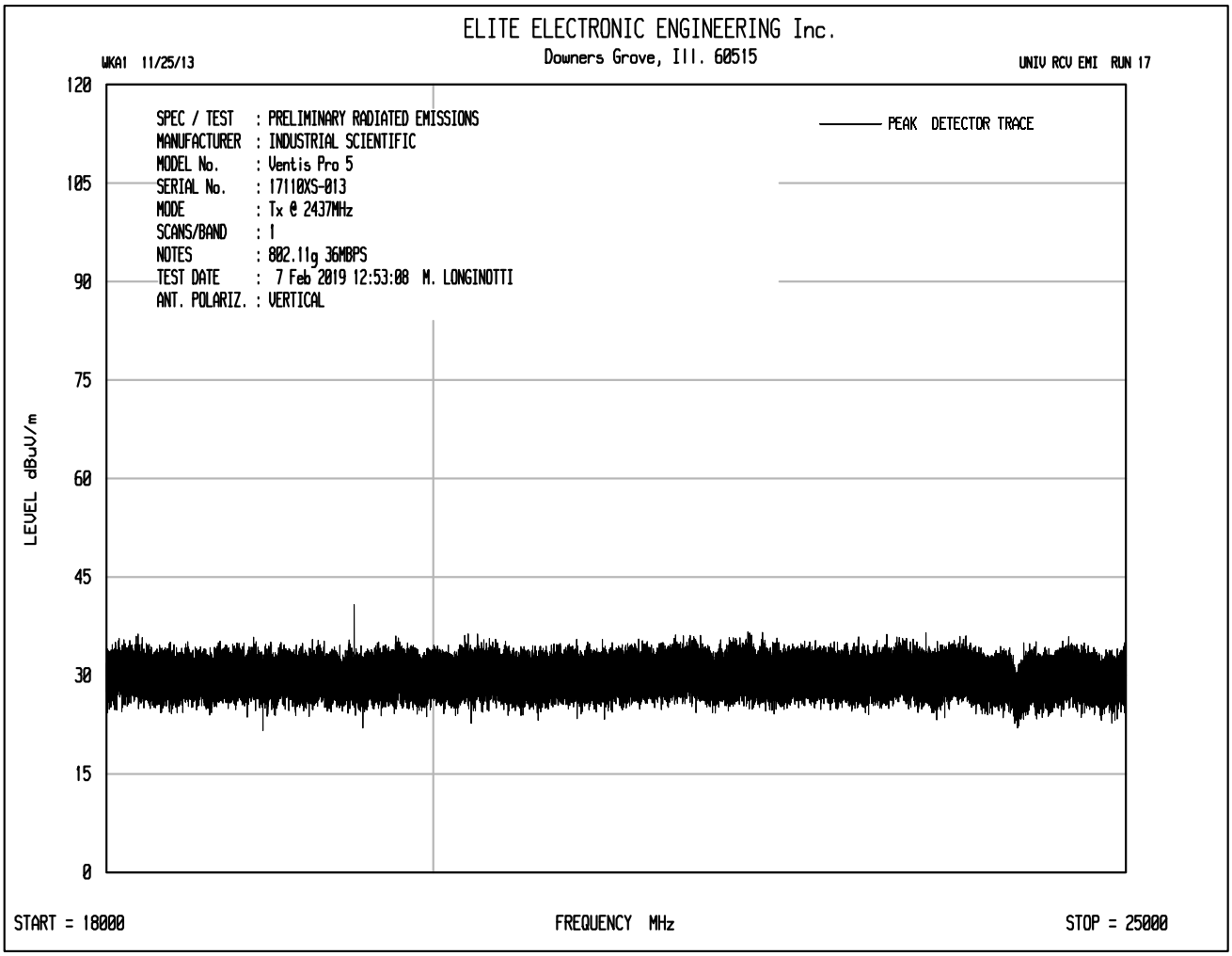

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 12
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : VentisPro5
SERIAL No. : 18103FE-007
MODE : Tx @ 2437MHz
SCANS/BAND : 1
NOTES : 802.11g 36MBPS
TEST DATE : 17 Jan 2019 10:52:29 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 13
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : VentisPro5
SERIAL No. : 18103FE-007
MODE : Tx @ 2437MHz
SCANS/BAND : 1
NOTES : 802.11g 36MBPS
TEST DATE : 17 Jan 2019 11:00:19 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 14
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : VentisPro5
SERIAL No. : 17110XS-013
MODE : Tx @ 2437MHz
SCANS/BAND : 1
NOTES : 802.11g 36MBPS
TEST DATE : 5 Feb 2019 11:19:17 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 13
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : VentisPro5
SERIAL No. : 17110XS-013
MODE : Tx @ 2437MHz
SCANS/BAND : 1
NOTES : 802.11g 36MBPS
TEST DATE : 5 Feb 2019 11:10:27 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 8
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : Ventis Pro 5
SERIAL No. : 17110XS-013
MODE : Tx @ 2437MHz
SCANS/BAND : 1
NOTES : 802.11g 36MBPS
TEST DATE : 7 Feb 2019 08:57:41 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 17
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : Ventis Pro 5
SERIAL No. : 17110XS-013
MODE : Tx @ 2437MHz
SCANS/BAND : 1
NOTES : 802.11g 36MBPS
TEST DATE : 7 Feb 2019 12:53:08 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 5
Serial No. : 18103FE-007 (17110XS-013 for all but fundamental)
Mode : Transmit at 2437MHz, 802.11g, 36Mbps, power = 0
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : January 17, 2019 through February 7, 2019
Test Distance : 3 meters
Notes : Peak Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
4874.00	H	49.2	Ambient	3.7	36.7	-39.3	50.2	324.6	5000.0	-23.8
4874.00	V	53.5	Ambient	3.7	36.7	-39.3	54.5	532.6	5000.0	-19.5
7311.00	H	49.1	Ambient	4.7	38.1	-39.4	52.5	420.5	5000.0	-21.5
7311.00	V	50.3	Ambient	4.7	38.1	-39.4	53.7	482.8	5000.0	-20.3
12185.00	H	49.7	Ambient	6.1	41.8	-39.1	58.5	840.0	5000.0	-15.5
12185.00	V	49.1	Ambient	6.1	41.8	-39.1	57.9	783.9	5000.0	-16.1
19496.00	H	34.5	Ambient	2.2	40.4	-28.8	48.3	260.1	5000.0	-25.7
19496.00	V	35.3	Ambient	2.2	40.4	-28.8	49.1	285.2	5000.0	-24.9

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked By: MARK E. LONGINOTTI

Mark E. Longinotti

Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 5
Serial No. : 18103FE-007 (17110XS-013 for all but fundamental)
Mode : Transmit at 2437MHz, 802.11g, 36Mbps, power = 0
Test Specification : FCC-15.247, RSS-247 Average Radiated Emissions in Restricted Bands
Date : January 17, 2019 through February 7, 2019
Test Distance : 3 meters
Notes : Average Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
4874.00	H	35.7	Ambient	3.7	36.7	-39.3	6.6	43.3	146.7	500.0	-10.7
4874.00	V	37.2	Ambient	3.7	36.7	-39.3	6.6	44.8	174.3	500.0	-9.2
7311.00	H	34.30	Ambient	4.7	38.1	-39.4	6.6	44.3	163.6	500.0	-9.7
7311.00	V	34.3	Ambient	4.7	38.1	-39.4	6.6	44.3	163.6	500.0	-9.7
12185.00	H	34.9	Ambient	6.1	41.8	-39.1	6.6	50.3	326.8	500.0	-3.7
12185.00	V	34.9	Ambient	6.1	41.8	-39.1	6.6	50.3	326.8	500.0	-3.7
19496.00	H	21.2	Ambient	2.2	40.4	-28.8	6.6	41.6	120.3	500.0	-12.4
19496.00	V	23.0	Ambient	2.2	40.4	-28.8	6.6	43.4	147.9	500.0	-10.6

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp + Duty Cycle

Checked By: MARK E. LONGINOTTI

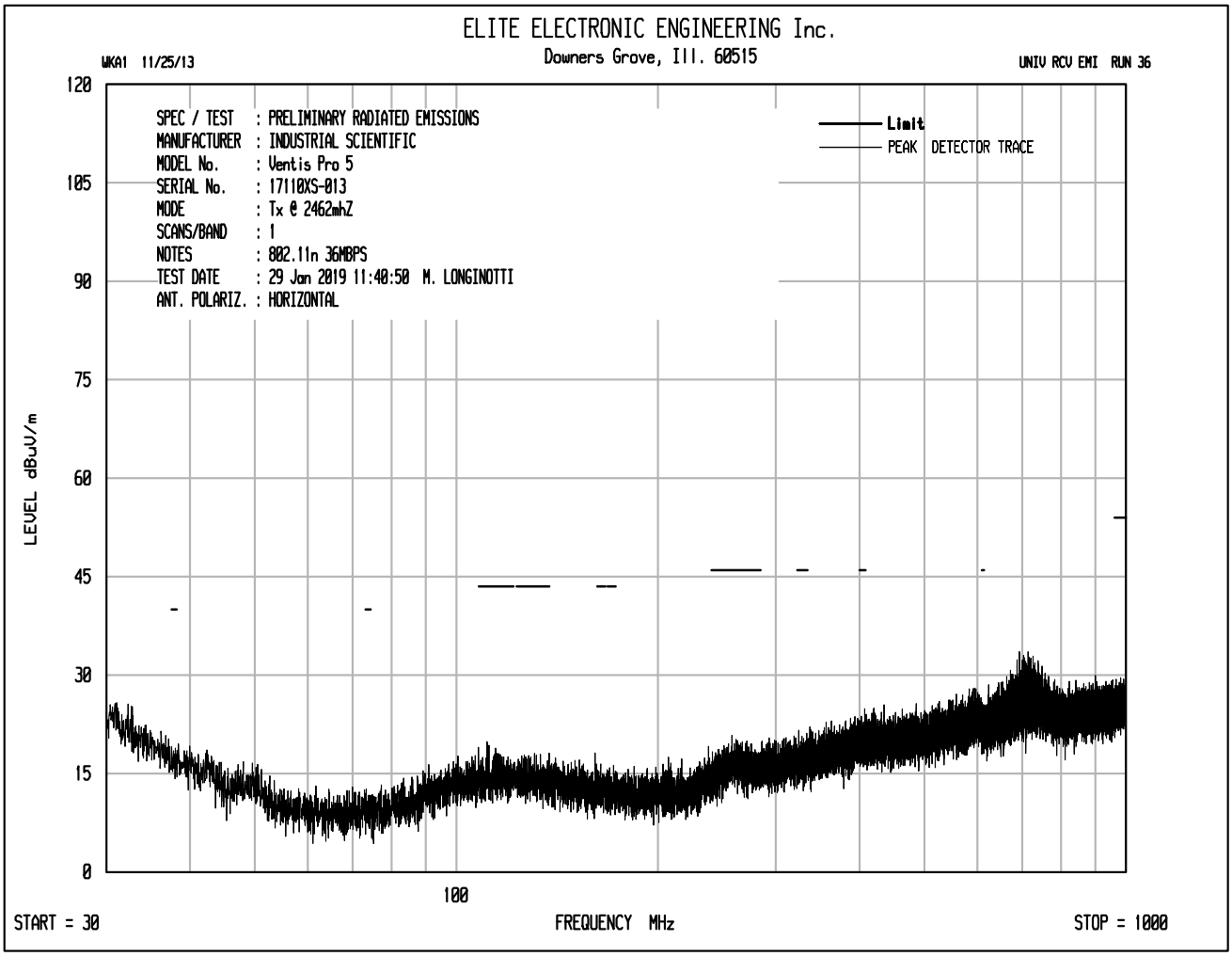
Mark E. Longinotti

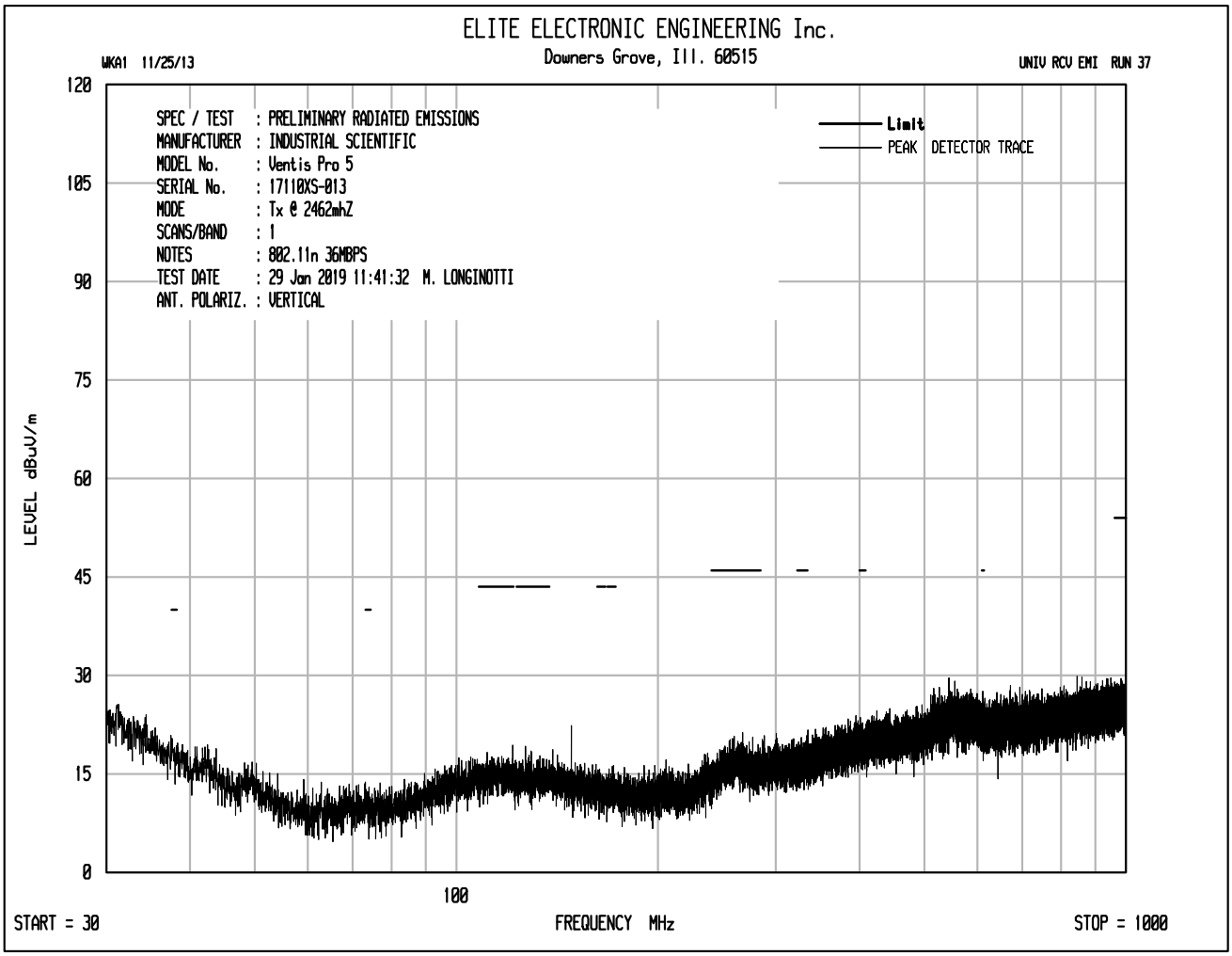
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 5
Serial No. : 18103FE-007 (17110XS-013 for all but fundamental)
Mode : Transmit at 2437MHz, 802.11g, 36Mbps, power = 0
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions not in Restricted Bands
Date : January 17, 2019 through February 7, 2019
Test Distance : 3 meters
Notes : Peak Detector with 100kHz Resolution Bandwidth

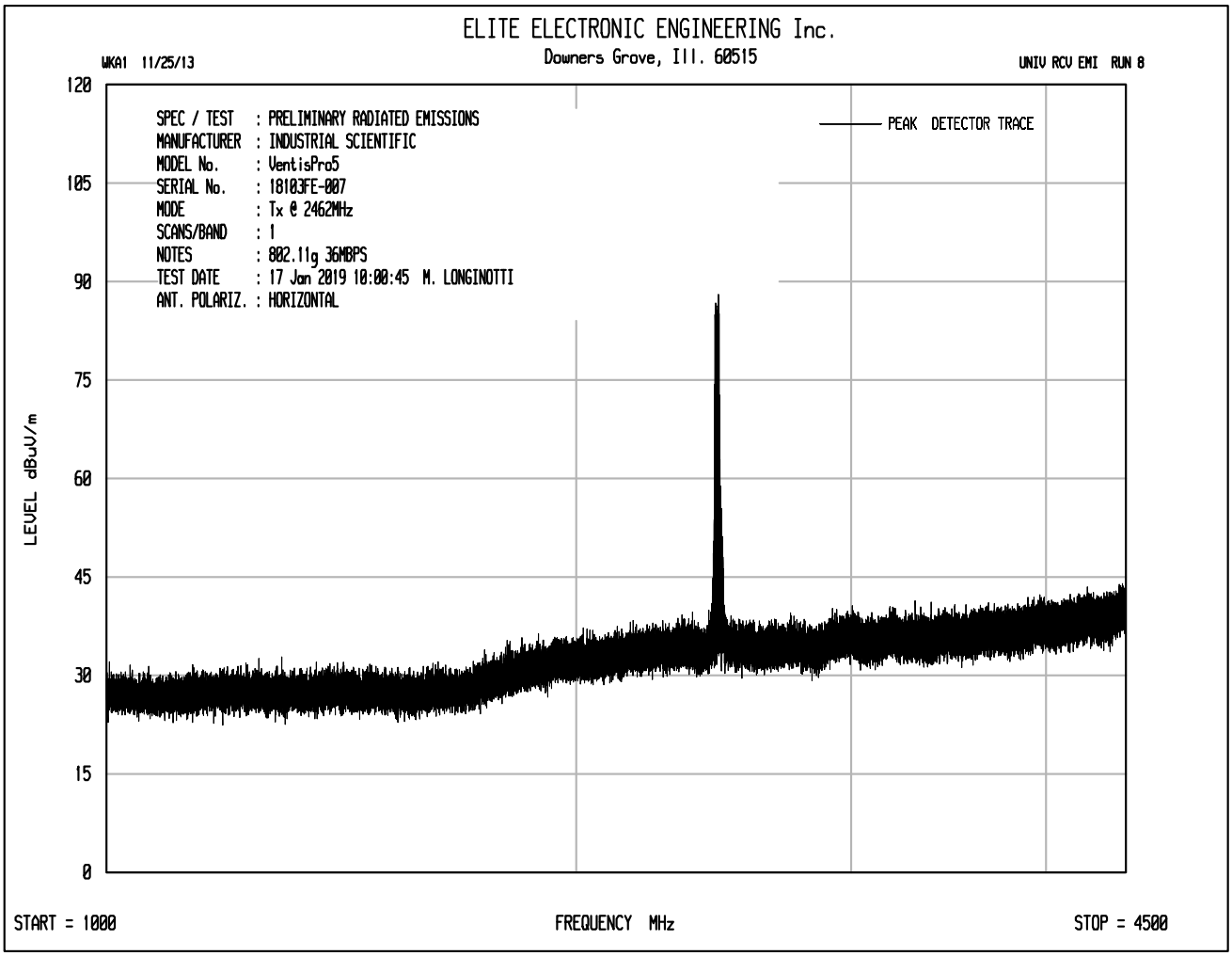
Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2437.00	H	62.2		2.6	33.6	-39.9	58.5	843.3		
2437.00	V	56.5		2.6	33.6	-39.9	52.8	437.5		
9748.00	H	39.5	Ambient	5.2	39.4	-39.3	44.8	174.4	5000.0	-29.1
9748.00	V	39.8	Ambient	5.2	39.4	-39.3	45.1	180.5	5000.0	-28.8
14622.00	H	39.3	Ambient	6.7	42.4	-38.2	50.1	320.8	5000.0	-23.9
14622.00	V	38.8	Ambient	6.7	42.4	-38.2	49.6	302.9	5000.0	-24.4
17059.00	H	38.1	Ambient	7.2	45.0	-37.5	52.9	439.1	5000.0	-21.1
17059.00	V	38.1	Ambient	7.2	45.0	-37.5	52.9	439.1	5000.0	-21.1
21933.00	H	24.1	Ambient	2.2	40.6	-29.4	37.5	75.2	5000.0	-36.5
21933.00	V	25.5	Ambient	2.2	40.6	-29.4	38.9	88.3	5000.0	-35.1
24370.00	H	25.5	Ambient	2.2	40.6	-30.4	38.0	79.3	5000.0	-36.0
24370.00	V	25.4	Ambient	2.2	40.6	-30.4	37.9	78.4	5000.0	-36.1
6498.69	H	55.3		4.4	37.8	-39.4	58.1	800.2	5000.0	-15.9
6498.69	V	51.1		4.4	37.8	-39.4	53.9	493.4	5000.0	-20.1

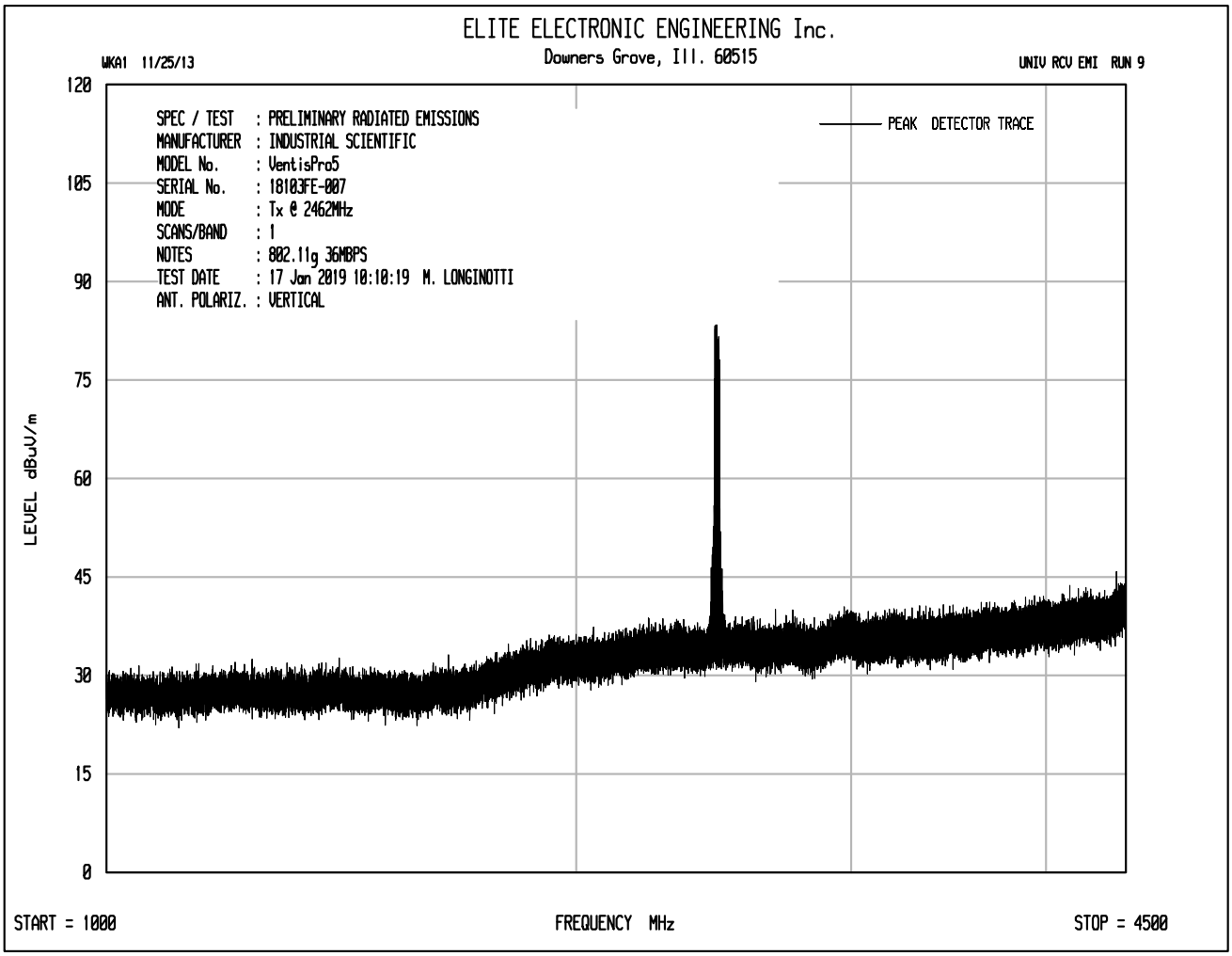
Checked By: MARK E. LONGINOTTI

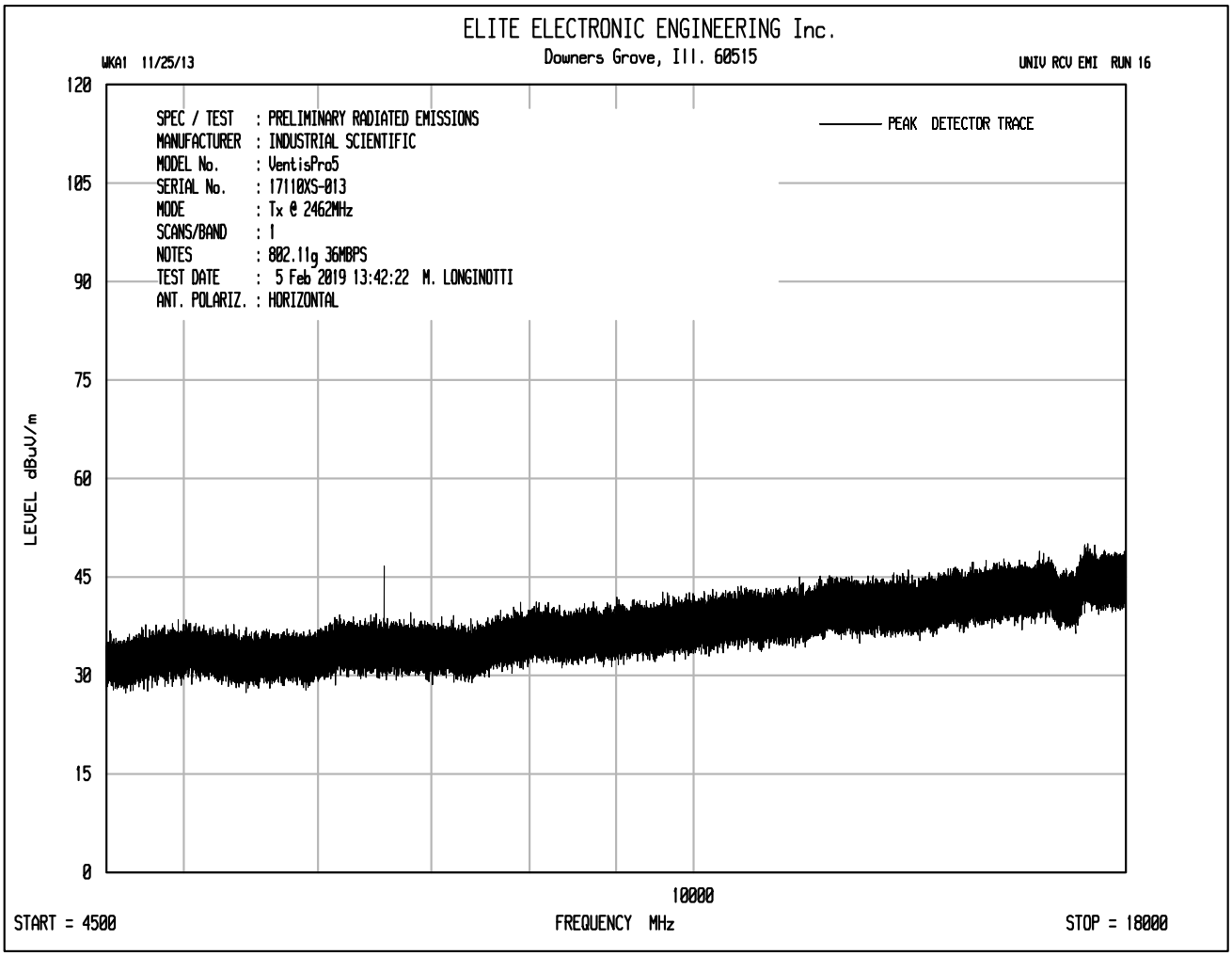
Mark E. Longinotti

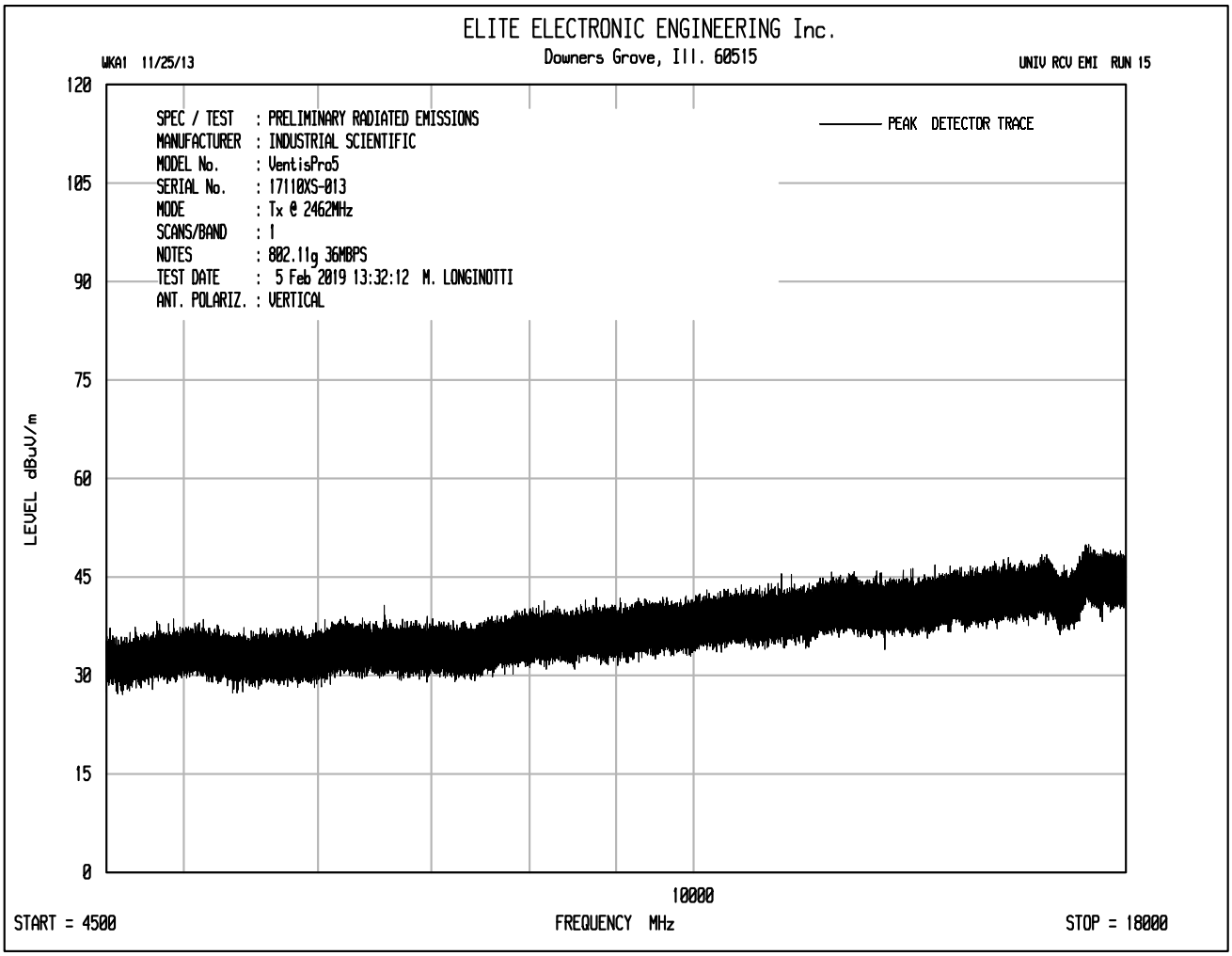

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 36
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : Ventis Pro 5
SERIAL No. : 17110XS-013
MODE : Tx @ 2462mhZ
SCANS/BAND : 1
NOTES : 802.11n 36MBPS
TEST DATE : 29 Jan 2019 11:40:50 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

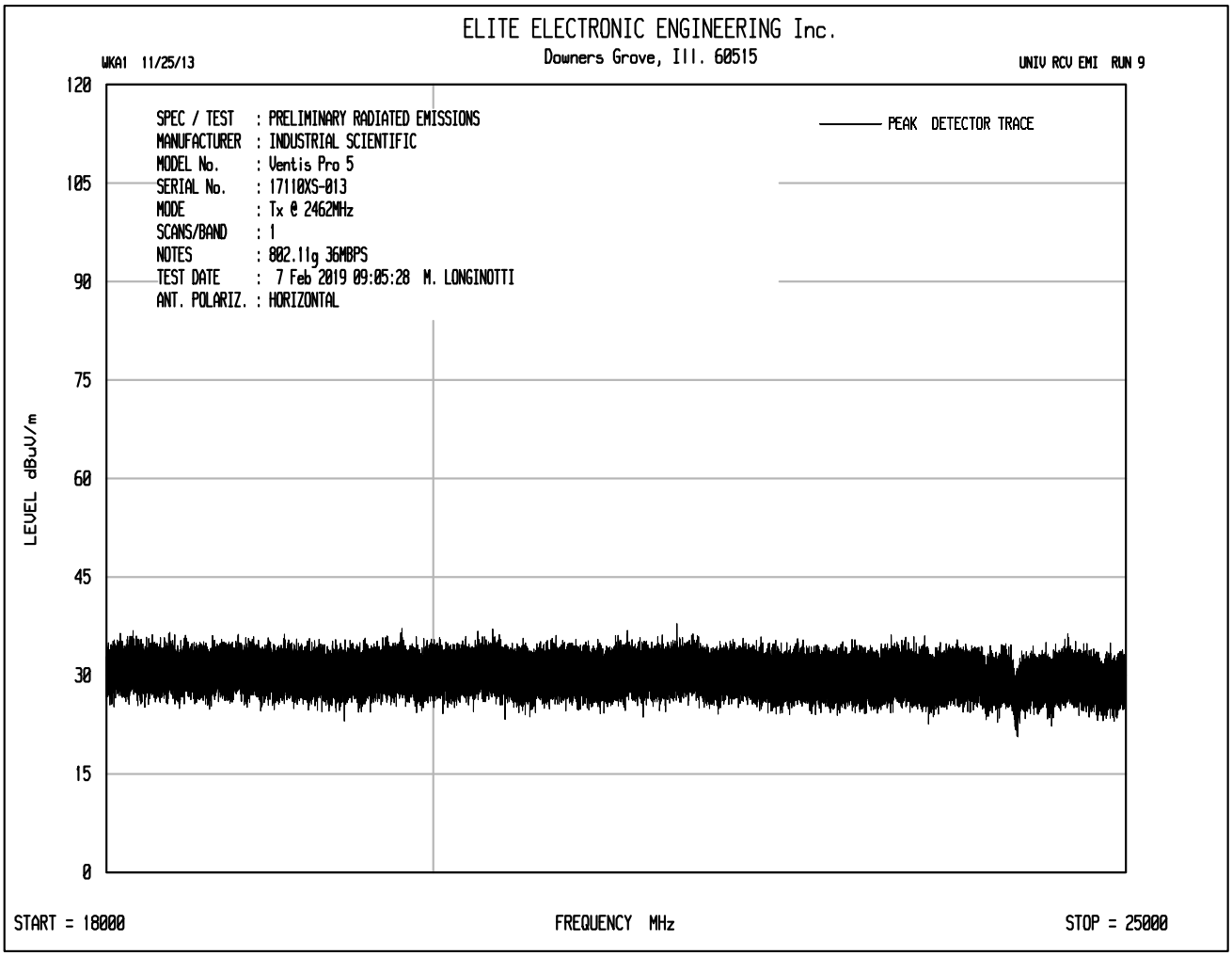

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 37
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : Ventis Pro 5
SERIAL No. : 17110XS-013
MODE : Tx @ 2462mhZ
SCANS/BAND : 1
NOTES : 802.11n 36MBPS
TEST DATE : 29 Jan 2019 11:41:32 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

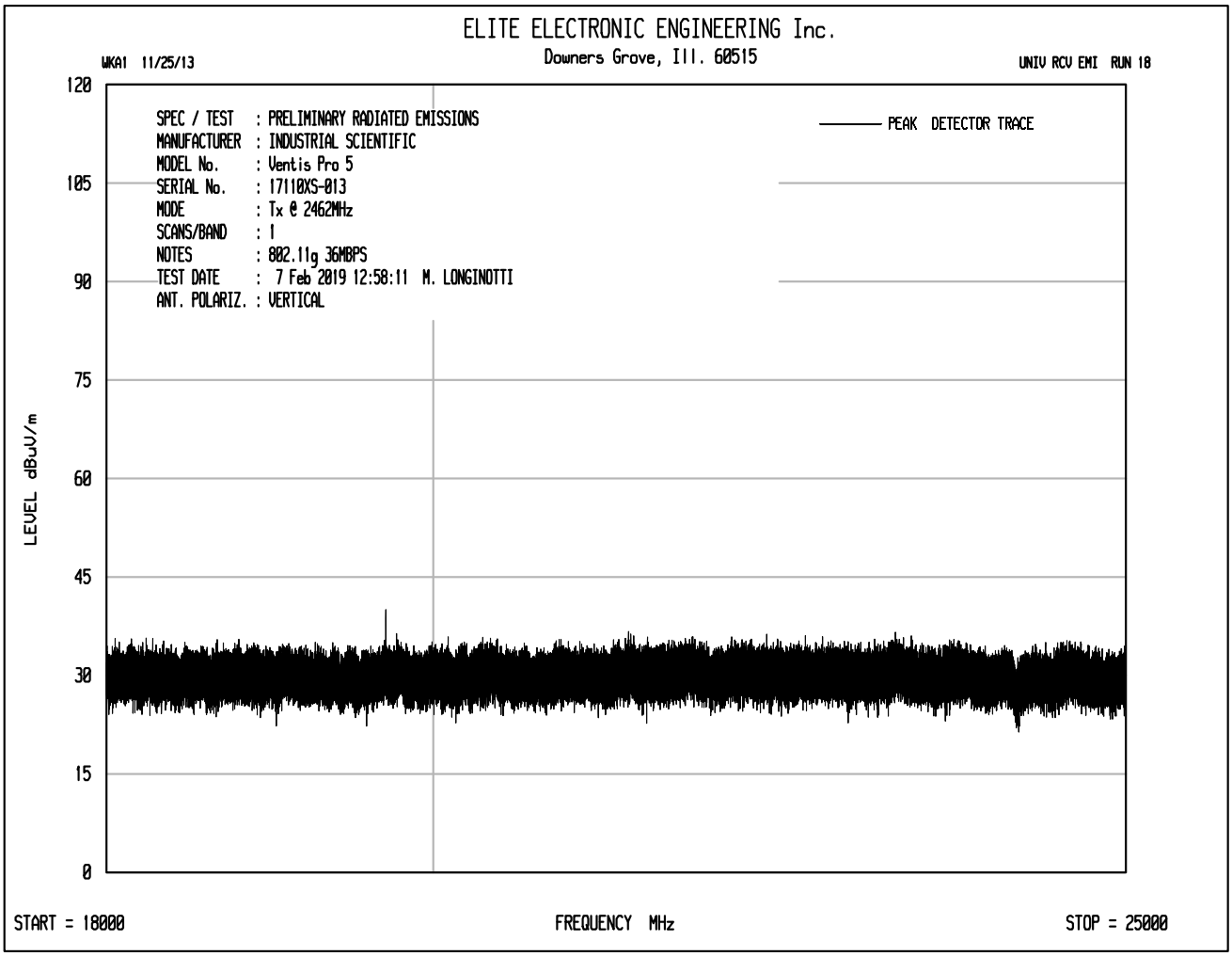

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 8
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : VentisPro5
SERIAL No. : 18103FE-007
MODE : Tx @ 2462MHz
SCANS/BAND : 1
NOTES : 802.11g 36MBPS
TEST DATE : 17 Jan 2019 10:00:45 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 9
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : VentisPro5
SERIAL No. : 18103FE-007
MODE : Tx @ 2462MHz
SCANS/BAND : 1
NOTES : 802.11g 36MBPS
TEST DATE : 17 Jan 2019 10:10:19 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 16
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : VentisPro5
SERIAL No. : 17110XS-013
MODE : Tx @ 2462MHz
SCANS/BAND : 1
NOTES : 802.11g 36MBPS
TEST DATE : 5 Feb 2019 13:42:22 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 15
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : VentisPro5
SERIAL No. : 17110XS-013
MODE : Tx @ 2462MHz
SCANS/BAND : 1
NOTES : 802.11g 36MBPS
TEST DATE : 5 Feb 2019 13:32:12 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 9
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : Ventis Pro 5
SERIAL No. : 17110XS-013
MODE : Tx @ 2462MHz
SCANS/BAND : 1
NOTES : 802.11g 36MBPS
TEST DATE : 7 Feb 2019 09:05:28 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 18
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : Ventis Pro 5
SERIAL No. : 17110XS-013
MODE : Tx @ 2462MHz
SCANS/BAND : 1
NOTES : 802.11g 36MBPS
TEST DATE : 7 Feb 2019 12:58:11 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 5
Serial No. : 18103FE-007 (17110XS-013 for all but fundamental)
Mode : Transmit at 2462MHz, 802.11g, 36Mbps, power = 0
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : January 17, 2019 through February 7, 2019
Test Distance : 3 meters
Notes : Peak Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
4924.00	H	50.4	Ambient	3.7	36.8	-39.3	51.6	379.3	5000.0	-22.4
4924.00	V	50.8	Ambient	3.7	36.8	-39.3	52.0	397.2	5000.0	-22.0
7386.00	H	48.1	Ambient	4.7	38.1	-39.4	51.5	377.2	5000.0	-22.4
7386.00	V	48.8	Ambient	4.7	38.1	-39.4	52.2	408.9	5000.0	-21.7
12310.00	H	49.7	Ambient	6.1	41.7	-39.0	58.5	837.2	5000.0	-15.5
12310.00	V	50.5	Ambient	6.1	41.7	-39.0	59.3	917.9	5000.0	-14.7
19696.00	H	35.0	Ambient	2.2	40.4	-28.5	49.1	286.6	5000.0	-24.8
19696.00	V	35.8	Ambient	2.2	40.4	-28.5	49.9	314.2	5000.0	-24.0
22158.00	H	35.3	Ambient	2.2	40.6	-29.3	48.8	275.4	5000.0	-25.2
22158.00	V	35.0	Ambient	2.2	40.6	-29.3	48.5	266.1	5000.0	-25.5

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked By: MARK E. LONGINOTTI

Mark E. Longinotti

Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 5
Serial No. : 18103FE-007 (17110XS-013 for all but fundamental)
Mode : Transmit at 2462MHz, 802.11g, 36Mbps, power = 0
Test Specification : FCC-15.247, RSS-247 Average Radiated Emissions in Restricted Bands
Date : January 17, 2019 through February 7, 2019
Test Distance : 3 meters
Notes : Average Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
4924.00	H	35.6	Ambient	3.7	36.8	-39.3	6.6	43.4	147.6	500.0	-10.6
4924.00	V	35.6	Ambient	3.7	36.8	-39.3	6.6	43.4	147.6	500.0	-10.6
7386.00	H	33.80	Ambient	4.7	38.1	-39.4	6.6	43.8	155.5	500.0	-10.1
7386.00	V	33.0	Ambient	4.7	38.1	-39.4	6.6	43.0	141.8	500.0	-10.9
12310.00	H	35.0	Ambient	6.1	41.7	-39.0	6.6	50.4	329.5	500.0	-3.6
12310.00	V	34.4	Ambient	6.1	41.7	-39.0	6.6	49.8	307.5	500.0	-4.2
19696.00	H	21.1	Ambient	2.2	40.4	-28.5	6.6	41.8	123.7	500.0	-12.1
19696.00	V	22.0	Ambient	2.2	40.4	-28.5	6.6	42.7	137.2	500.0	-11.2
22158.00	H	21.2	Ambient	2.2	40.6	-29.3	6.6	41.3	116.1	500.0	-12.7
22158.00	V	20.8	Ambient	2.2	40.6	-29.3	6.6	40.9	110.9	500.0	-13.1

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp + Duty Cycle

Checked By: MARK E. LONGINOTTI

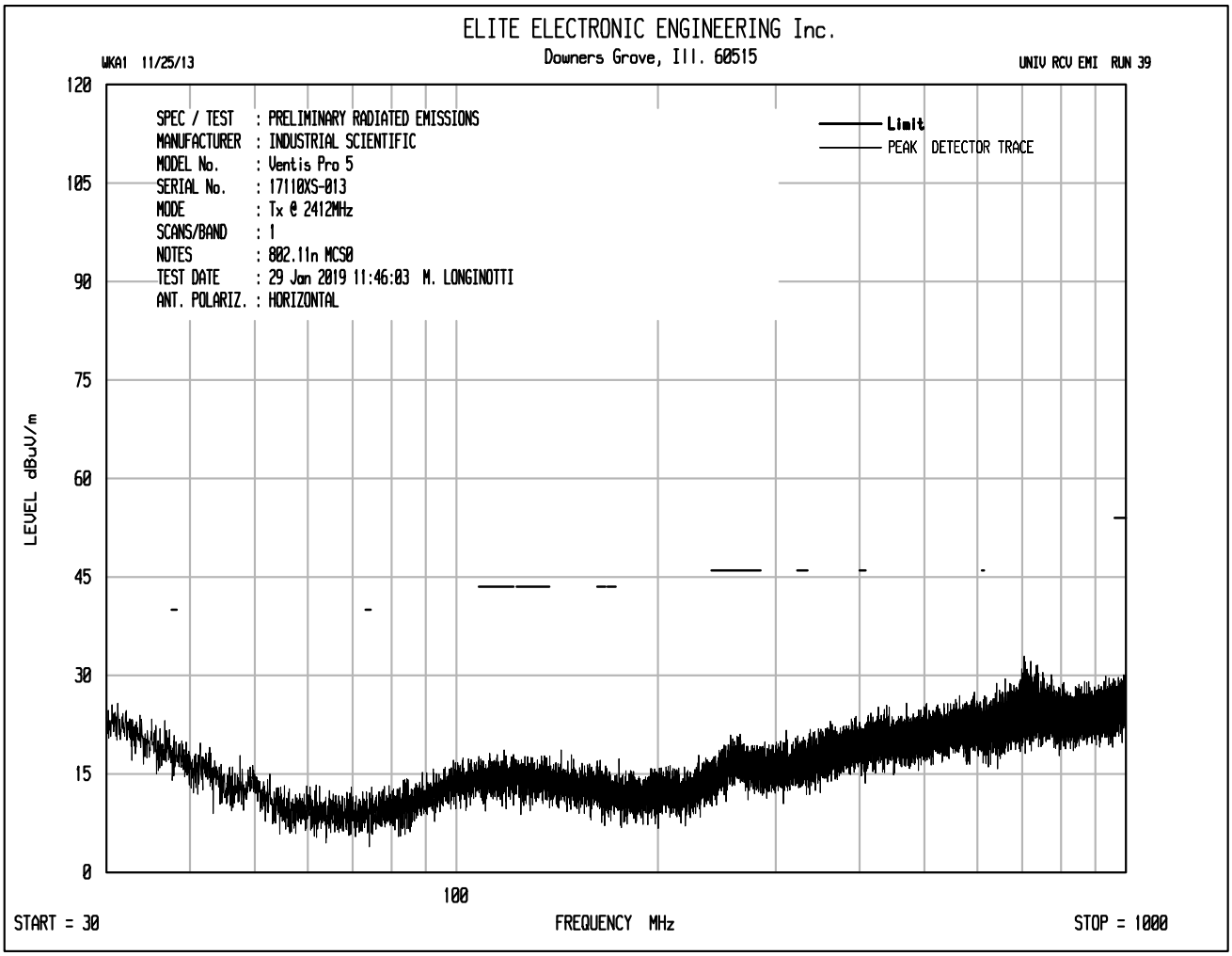
Mark E. Longinotti

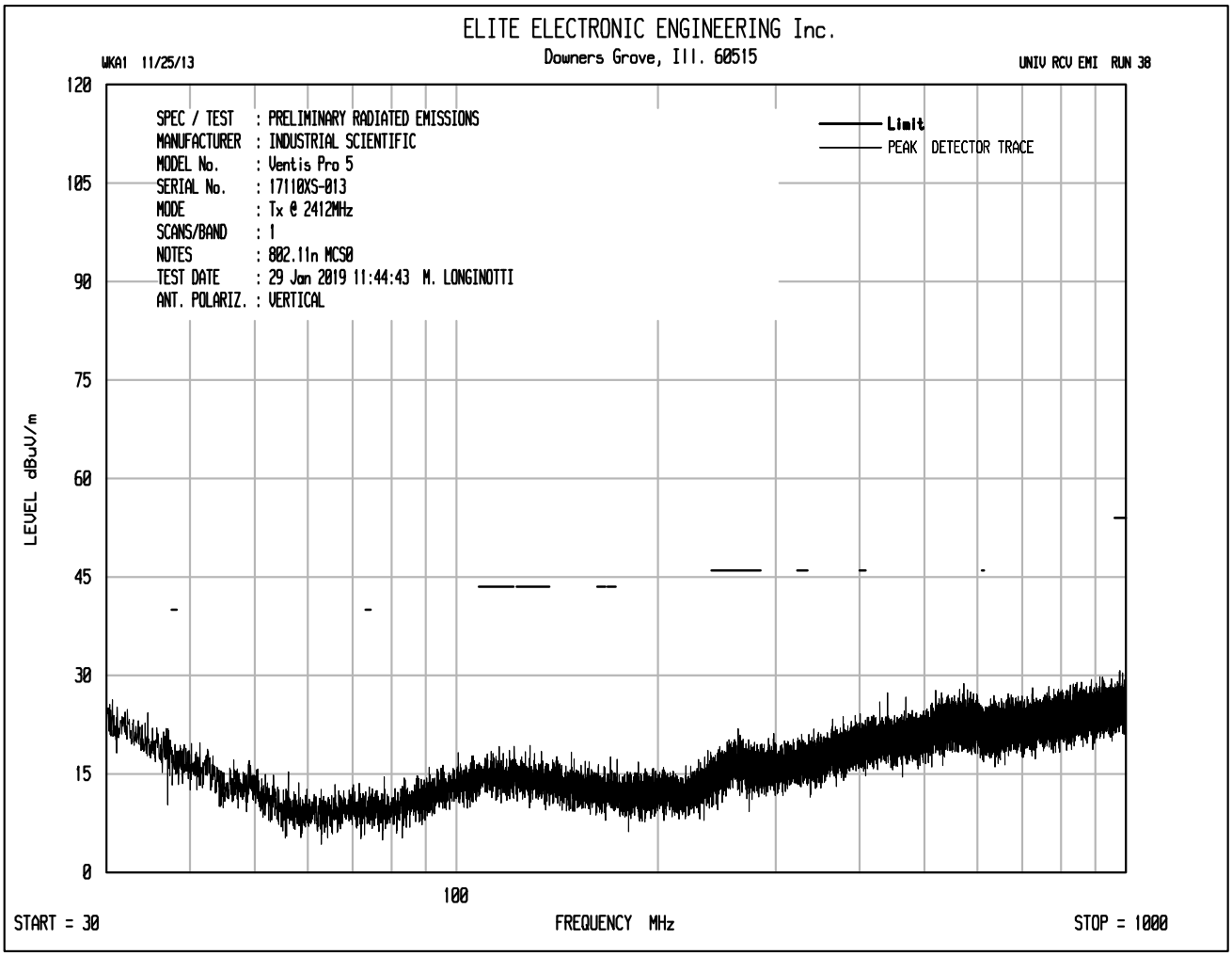
Manufacturer : Industrial Scientific Corporation
Test Item : Gas Monitor
Model No. : Ventis Pro 5
Serial No. : 18103FE-007 (17110XS-013 for all but fundamental)
Mode : Transmit at 2462MHz, 802.11g, 36Mbps, power = 0
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions not in Restricted Bands
Date : January 17, 2019 through February 7, 2019
Test Distance : 3 meters
Notes : Peak Detector with 100kHz Resolution Bandwidth

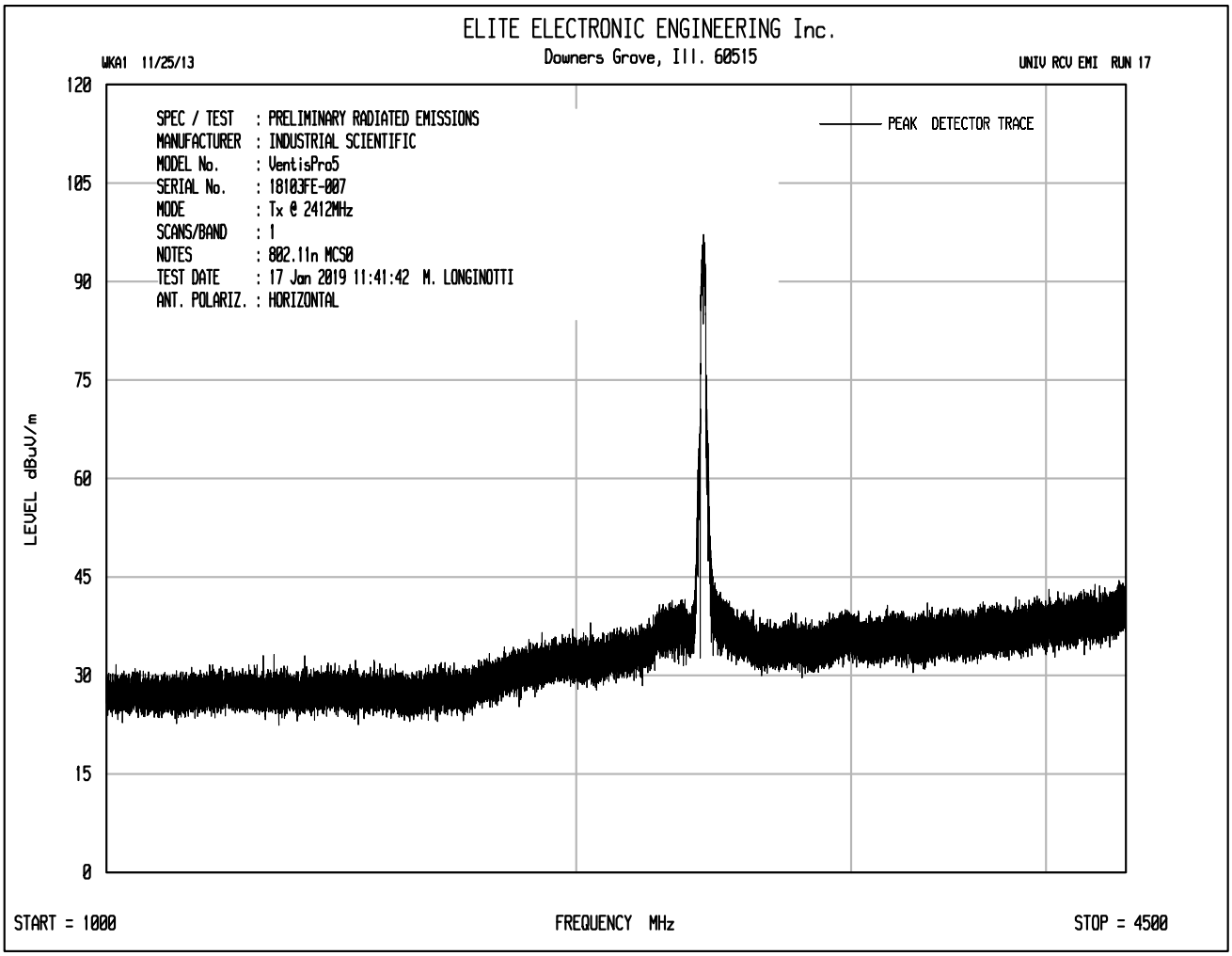
Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2462.00	H	56.5		2.6	33.6	0.0	92.7	43343.3		
2462.00	V	50.3		2.6	33.6	0.0	86.5	21228.6		
9848.00	H	39.6	Ambient	5.3	39.5	-39.2	45.2	181.3	5000.0	-28.8
9848.00	V	39.5	Ambient	5.3	39.5	-39.2	45.1	179.2	5000.0	-28.9
14772.00	H	40.0	Ambient	6.8	42.6	-38.2	51.2	361.8	5000.0	-22.8
14772.00	V	38.7	Ambient	6.8	42.6	-38.2	49.9	311.5	5000.0	-24.1
17234.00	H	38.7	Ambient	7.3	44.6	-37.7	53.0	445.7	5000.0	-21.0
17234.00	V	38.5	Ambient	7.3	44.6	-37.7	52.8	435.6	5000.0	-21.2
24620.00	H	25.6	Ambient	2.2	40.6	-30.7	37.7	77.1	5000.0	-36.2
24620.00	V	25.3	Ambient	2.2	40.6	-30.7	37.4	74.5	5000.0	-36.5
6565.36	H	56.9		4.4	38.1	-39.4	60.0	995.7	5000.0	-14.0
6565.36	V	53.2		4.4	38.1	-39.4	56.3	650.3	5000.0	-17.7

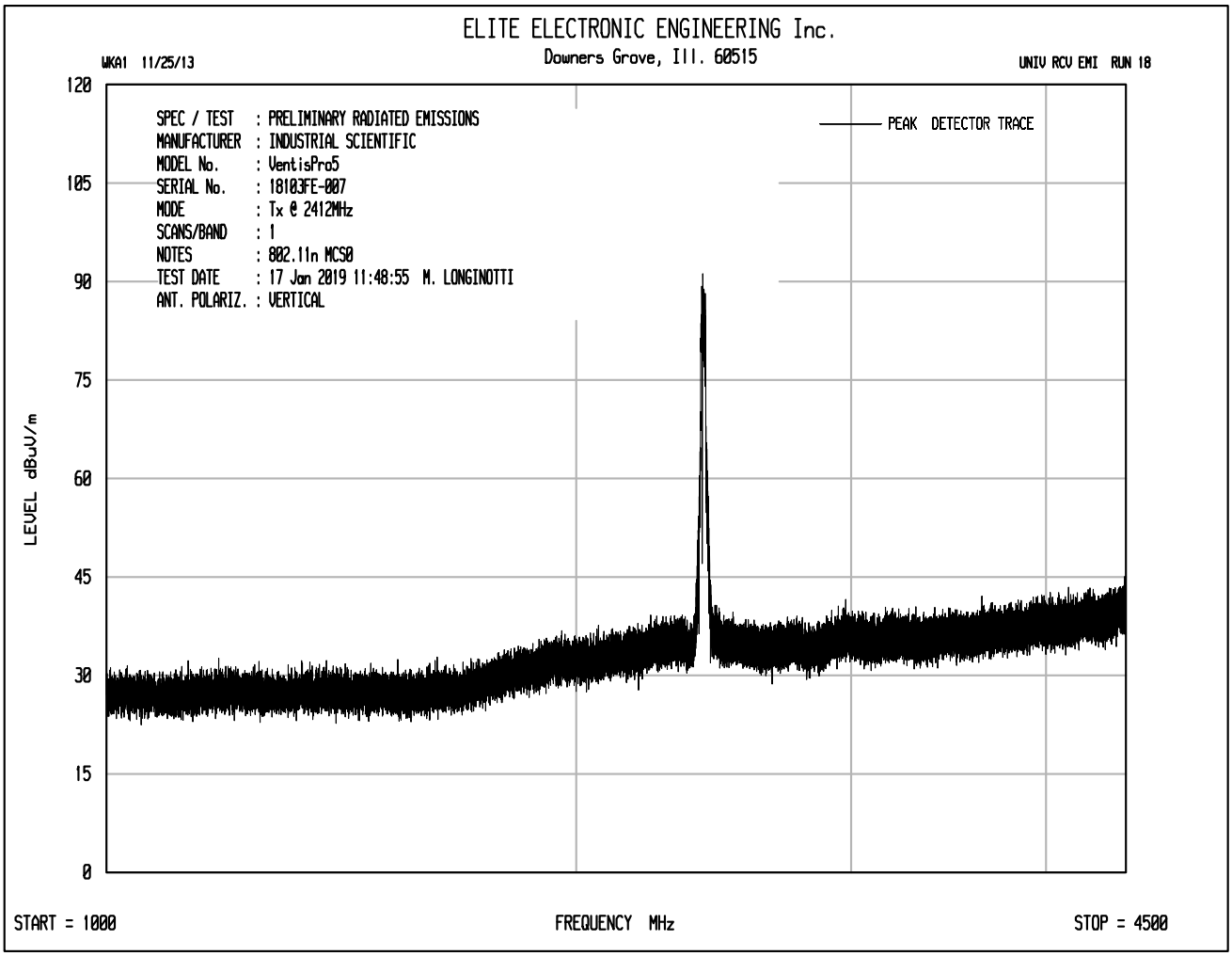
Checked By: MARK E. LONGINOTTI

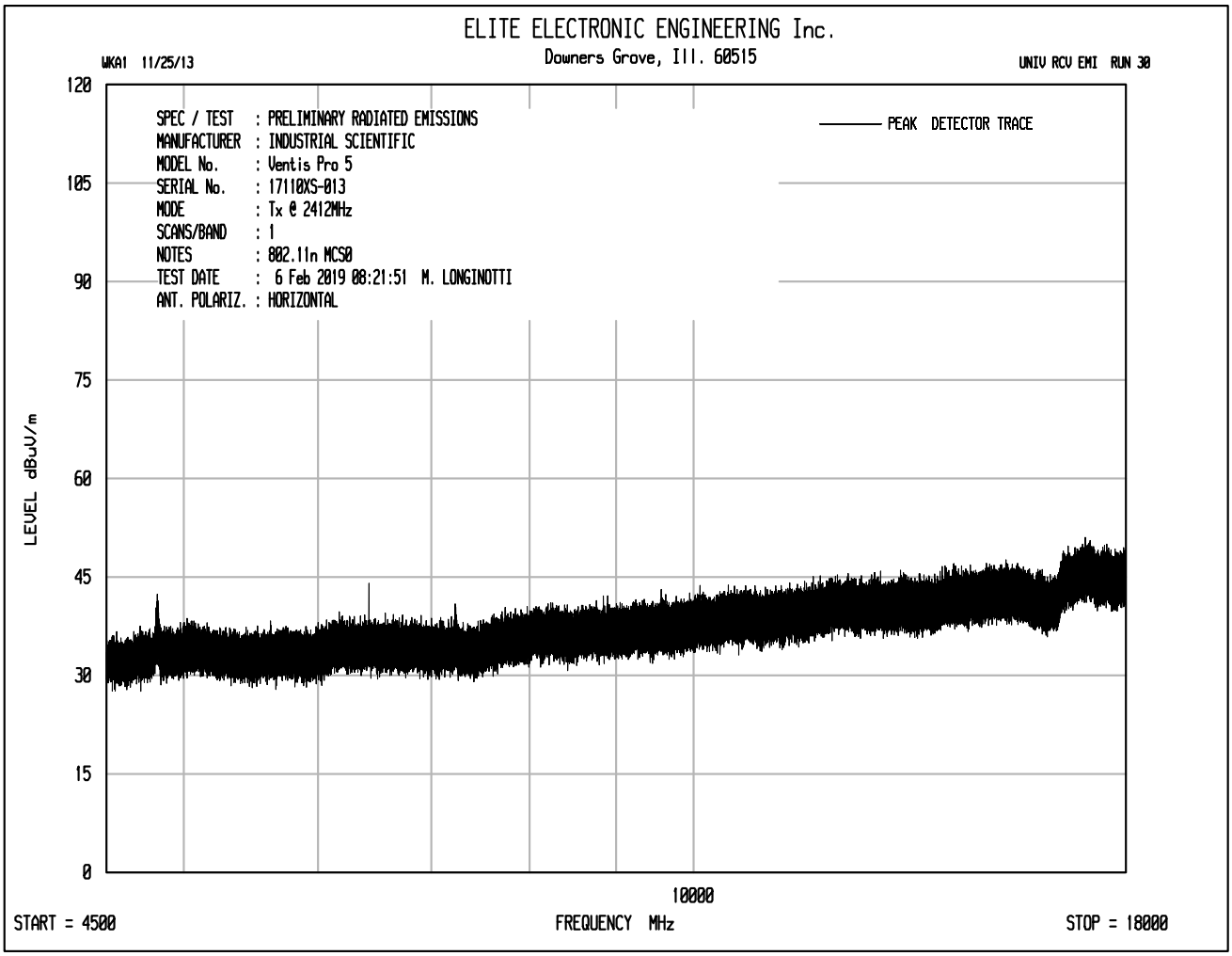
Mark E. Longinotti

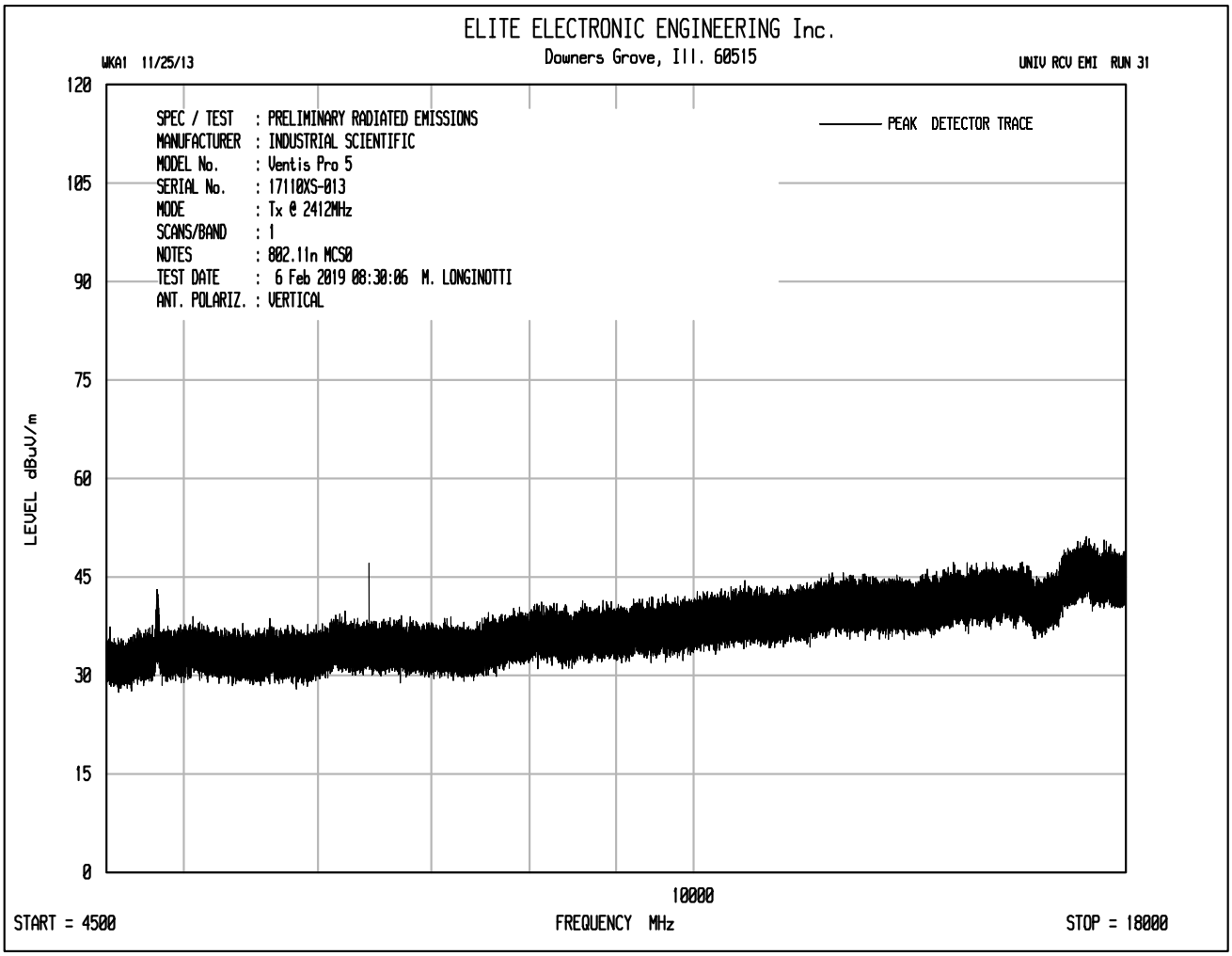

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 39
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : Ventis Pro 5
SERIAL No. : 17110XS-013
MODE : Tx @ 2412MHz
SCANS/BAND : 1
NOTES : 802.11n MCS0
TEST DATE : 29 Jan 2019 11:46:03 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

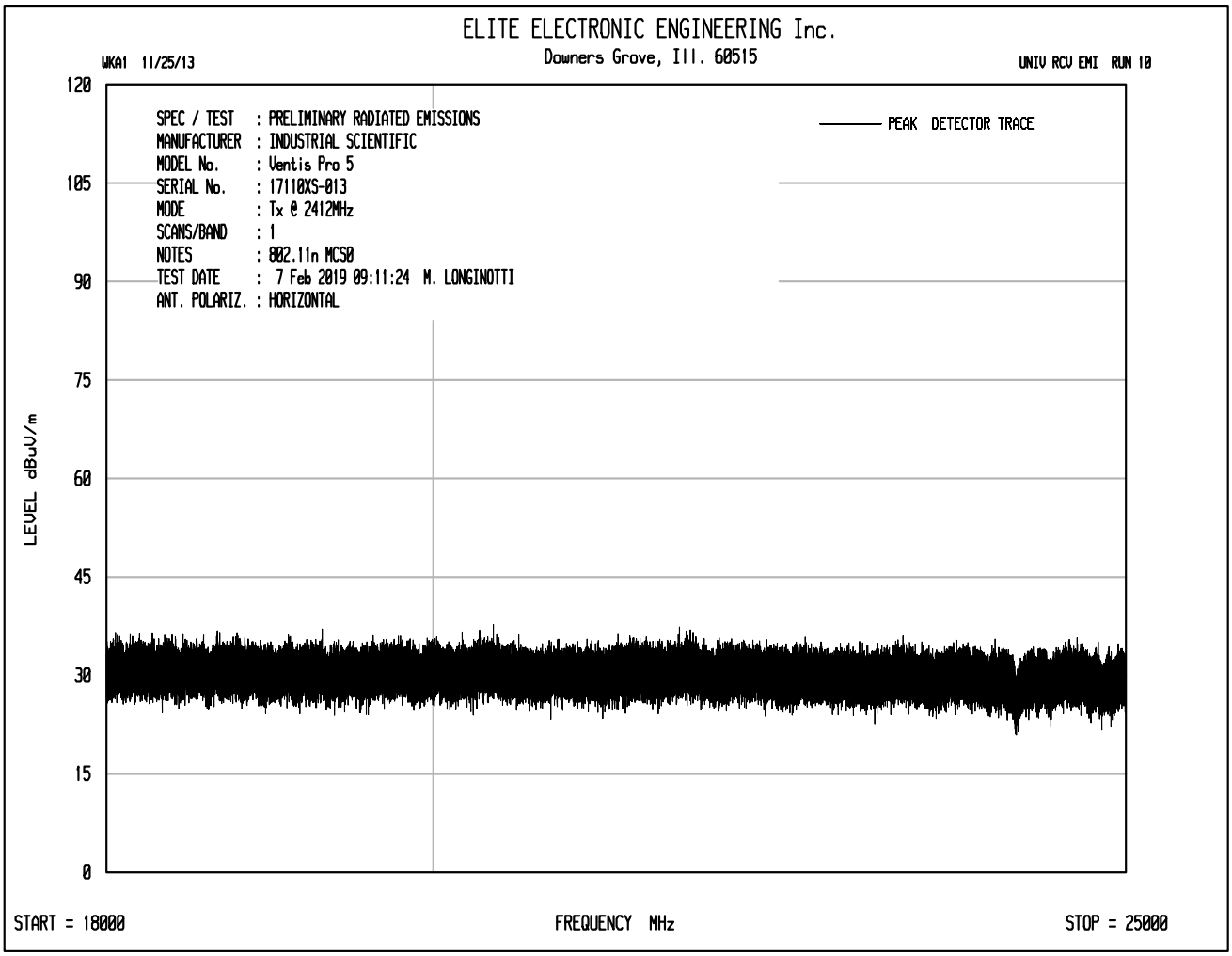

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 38
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : Ventis Pro 5
SERIAL No. : 17110XS-013
MODE : Tx @ 2412MHz
SCANS/BAND : 1
NOTES : 802.11n MCS0
TEST DATE : 29 Jan 2019 11:44:43 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 17
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : VentisPro5
SERIAL No. : 18103FE-007
MODE : Tx @ 2412MHz
SCANS/BAND : 1
NOTES : 802.11n MCS0
TEST DATE : 17 Jan 2019 11:41:42 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 18
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : VentisPro5
SERIAL No. : 18103FE-007
MODE : Tx @ 2412MHz
SCANS/BAND : 1
NOTES : 802.11n MCS0
TEST DATE : 17 Jan 2019 11:48:55 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 30
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : Ventis Pro 5
SERIAL No. : 17110XS-013
MODE : Tx @ 2412MHz
SCANS/BAND : 1
NOTES : 802.11n MCS0
TEST DATE : 6 Feb 2019 08:21:51 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 31
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : Ventis Pro 5
SERIAL No. : 17110XS-013
MODE : Tx @ 2412MHz
SCANS/BAND : 1
NOTES : 802.11n MCS0
TEST DATE : 6 Feb 2019 08:30:06 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : INDUSTRIAL SCIENTIFIC
MODEL No. : Ventis Pro 5
SERIAL No. : 17110XS-013
MODE : Tx @ 2412MHz
SCANS/BAND : 1
NOTES : 802.11n MCS0
TEST DATE : 7 Feb 2019 09:11:24 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000