



5G mmWave Meter Learning Session

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Safe and Sound Pro mm Wave Meter

Introductory Video



<https://www.youtube.com/watch?v=bwISuoQ0s-4&t=1s>

S & S Pro mm Wave Meter - Challenges

8 months of development – Release date June 30 2023 (Apologies for Delays)

Getting stable response required additional R & D to get desired BBI spec

We don't want to compromise on specifications and pricing

- Power usage very high (Difficult getting 6 hour battery life)
- Horn Antenna very costly
- Sensitivity below $0.5 \mu\text{W}/\text{m}^2$ - biggest challenge

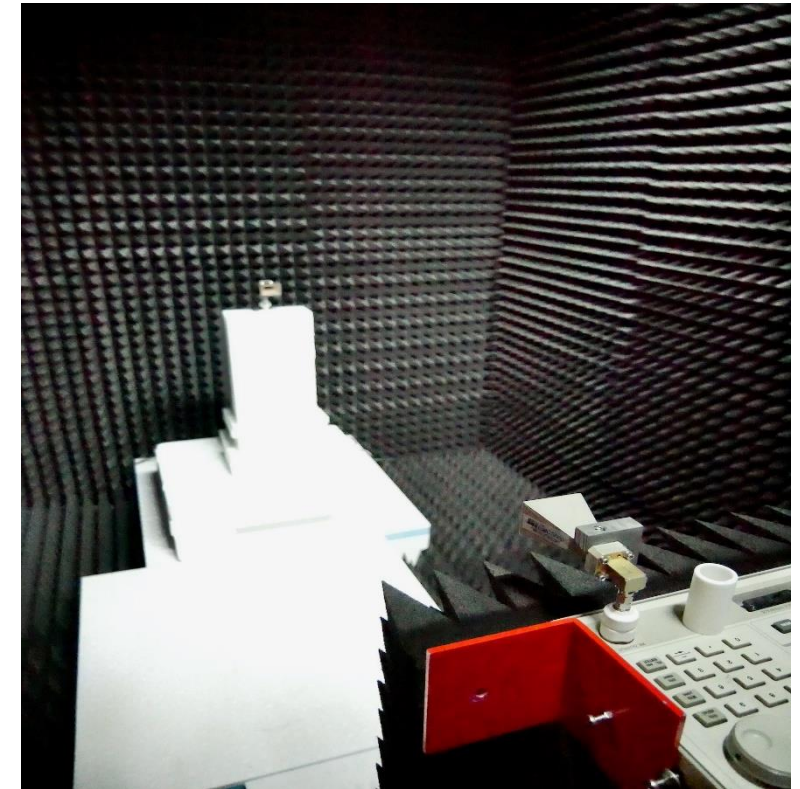
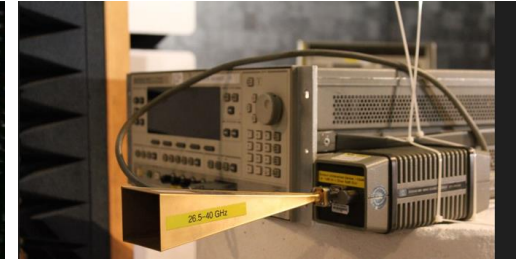
It is challenging – know of 2 other companies that have tried and failed after 2 years of development

Parts are very expensive and hard to source

Found testing is expensive at 3rd party facilities - Found they did not have adequate equipment to test to our needs and no testing methodology

Purchased own signal generators and power meters / spectrum analyzers
1 MHz to 40 GHz

Constructed SLT Full Anechoic Chamber (700MHz - ∞) (ceilings, walls and floor)



Safe and Sound Pro mm Wave Meter

Base Model



Frequency Range - **20** GHz to 40 GHz - High Band 5G RF Meter

- In USA covers 28 and 39 GHz 5G mmWave bands – live in major cities Verizon Wireless, AT&T, T-Mobile, Dish
- In Canada covers 26, 28 and 38 GHz - mmWave bands - spectrum auction planned for 2024
- They're called mmWave because their wavelengths are under a centimeter
- Industry calls this service Ultra Wideband (UW) (5G+)

Cost: \$849 USD (Base Model) **Release Date:** June 30, 2023

<https://safelivingtechnologies.com/products/safe-and-sound-pro-mmwave-meter.html>

Features:

- Detects and measures 5G in the High mmWave band, **20** GHz to 40 GHz
- Common sources in this range: 5G high band cell towers, 5G high band cell phones, radar, automobile radar, point to point communication dishes and more...
- Built in North America, consumer-level
- Accurate and affordable – at a fraction of the cost of current High band detectors
- The perfect companion to Safe and Sound Pro II RF Meter
- Digital display in $\mu\text{W}/\text{m}^2$ and V/m - peak and average readings - Peak Hold
- Response Time < 50 μs
- Battery Life of 6 Hours with sound
- Audio feature – each source has unique sound – 3 levels

Horn Option



S & S Pro mm Wave Meter – LED Indicators



4 Colored LEDs like the Pro II and Classis II:

Red (Fast Flash)	100,000 - 500,000 $\mu\text{W}/\text{m}^2$
Red (Flash)	10,000 - 100,000 $\mu\text{W}/\text{m}^2$
Red	1000 - 10,000 $\mu\text{W}/\text{m}^2$
Orange	100-1000 $\mu\text{W}/\text{m}^2$
Yellow	10-100 $\mu\text{W}/\text{m}^2$
Green	1-10 $\mu\text{W}/\text{m}^2$
Green (Flashing)	$< 1 \mu\text{W}/\text{m}^2$

S & S Pro mm Wave Meter – Antenna Reception Pattern

Horn - Directional
35 degree Beam width
Front only
Left Right and Up and Down



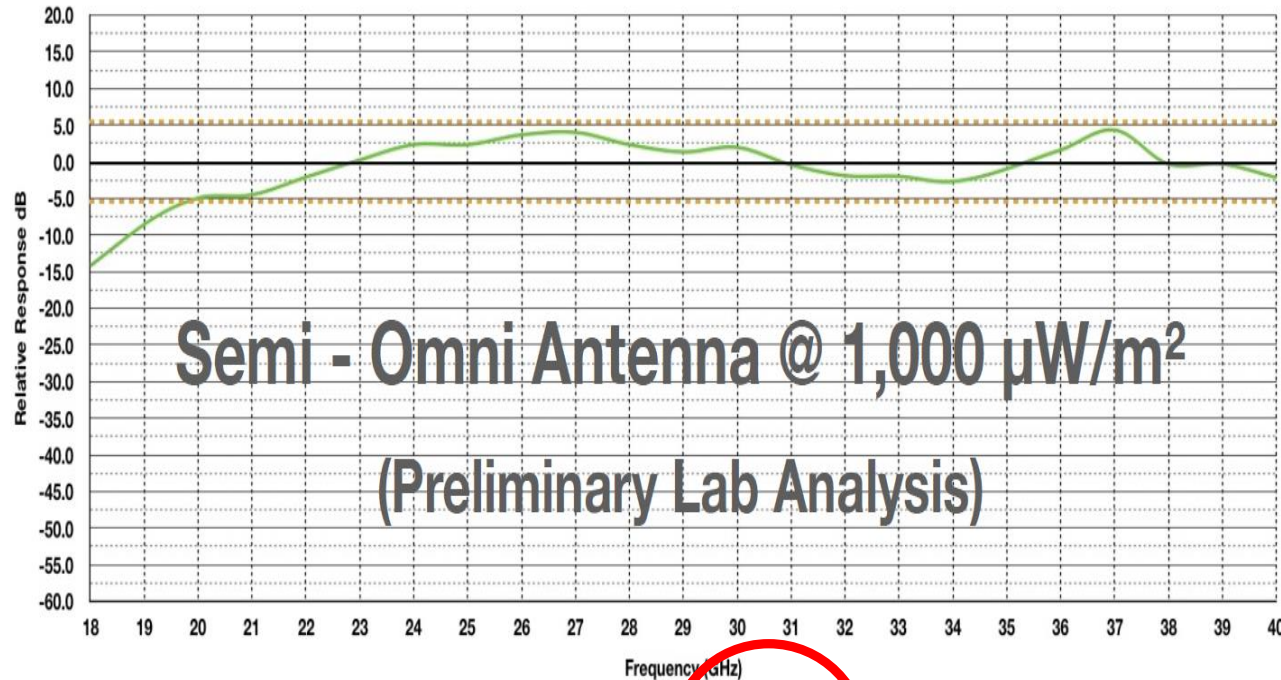
Stub – Semi Omni Directional
50 degree Beam width
Front and Back
Left Right and Up and Down



Some side lobes as well

Stub Will yield higher readings

S & S Pro mm Wave Meter - Specifications



Stub Antenna :Semi Omni-directional

Frequency Response: +/- 5dB from 20-40 GHz (effective down to 18 GHz with reduced tolerance)

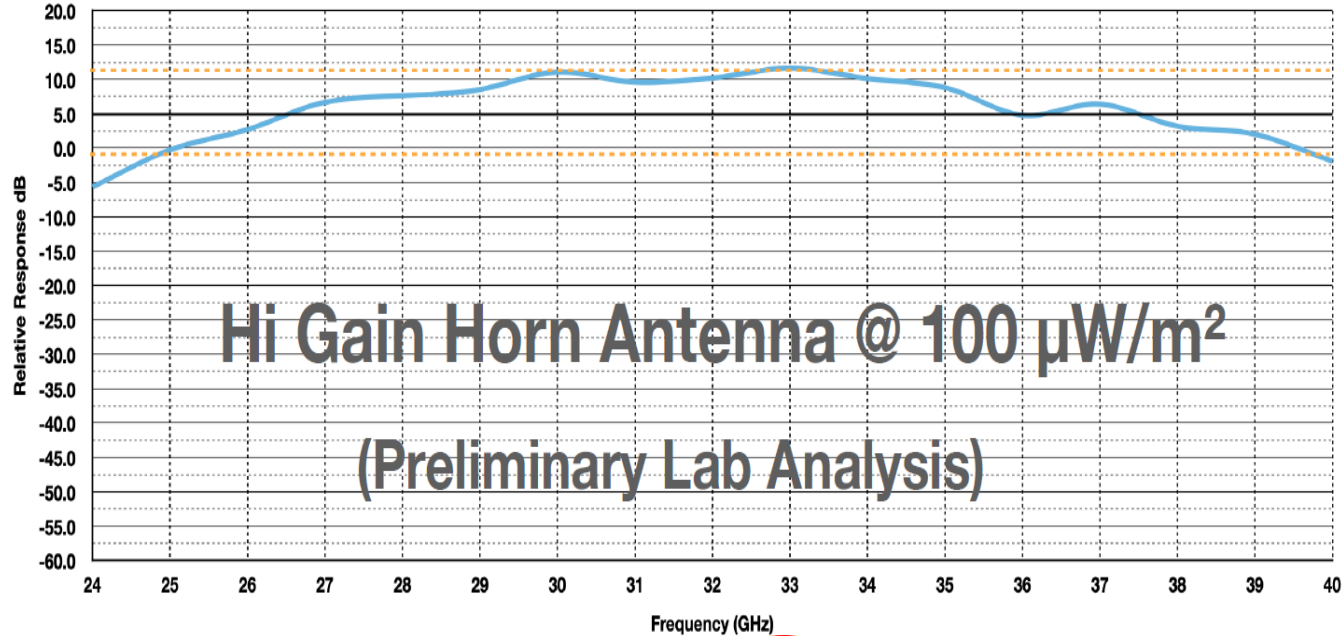
Minimum measurable signal: 5 $\mu\text{W}/\text{m}^2$

Maximum measurable signal: 500,000 $\mu\text{W}/\text{m}^2$ or (50,000,000 $\mu\text{W}/\text{m}^2$ with attenuator)

Reception Pattern: Semi Omni-Directional reception pattern (50 degrees front and 50 degrees back)

Best reception: Best to have SLT Logo on Stub Facing the source, blank side faces the user

S & S Pro mm Wave Meter - Specifications



Horn Antenna - Directional

Frequency Response: +/- 6dB from 25 GHz - 40 GHz

Minimum measurable signal: 0.5 $\mu\text{W}/\text{m}^2$

Maximum measurable signal: 30,000 $\mu\text{W}/\text{m}^2$ or
(3,000,000 $\mu\text{W}/\text{m}^2$ with attenuator)

Directional reception pattern (35 degrees front)

Antenna: Customized for SLT

S & S Pro mm Wave Meter - Specifications



Attenuator

(-20dB or 100X signal reducer)

Frequency Response: DC (0 Hz) - 40 GHz

Attach between antenna and meter

Multiply display reading x 100

Allows the meter to display higher power density signals by a factor of 100

Range of up to 50,000,000 $\mu\text{W}/\text{m}^2$ with Stub Antenna + Fixed Attenuator

Range of up to 3,000,000 $\mu\text{W}/\text{m}^2$ with Directional Horn Antenna + Fixed Attenuator

S & S Pro mm Wave Meter - Specifications



Attenuator

(Built in Power Overload Protection)

This RF detector chip is susceptible to damage if exposed to continuous high levels of RF

Overload Protection is activated when the following Power Density levels are exceeded:

Stub Antenna ($> 500,000 \mu\text{W}/\text{m}^2$ sustained)

Horn Antenna ($> 30,000 \mu\text{W}/\text{m}^2$ sustained)

Meter will power down after 3 seconds of elevated exposure and display a warning message

To read these higher power densith levels, Install attenuator

S & S Pro mm Wave Meter - Operation



Startup

Self Calibration

Battery Life

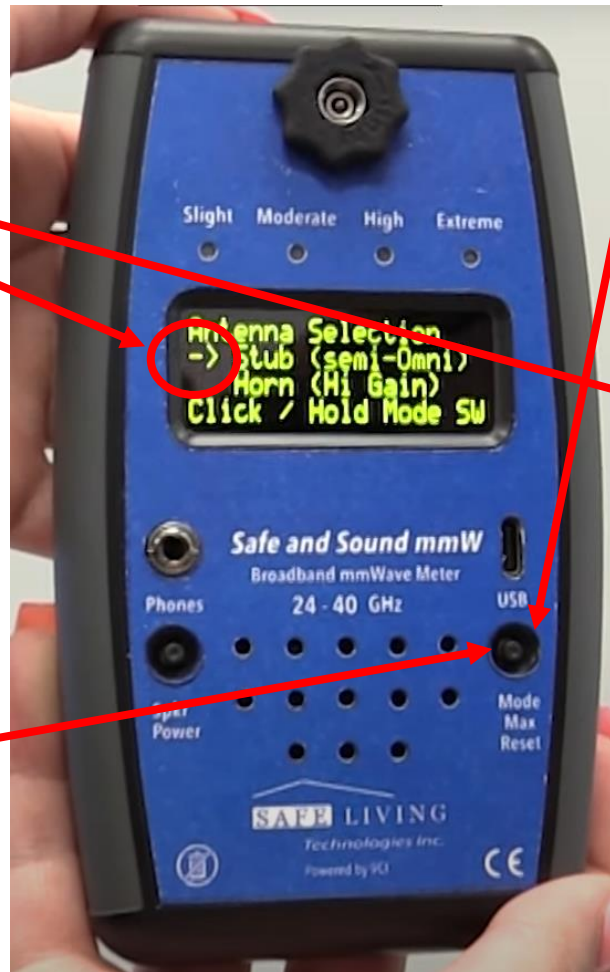
Can run continually if plugged into USB C Power

S & S Pro mm Wave Meter - Operation

Select Antenna Type VIA the Mode Switch (SW)

Press Mode Switch once to Toggle Antenna (Stub/Horn)

Press and Hold Mode Switch for 3 seconds to Select and Set Desired Antenna



S & S Pro mm Wave Meter - Operation

Measurement Types:

Peak

Peak Max

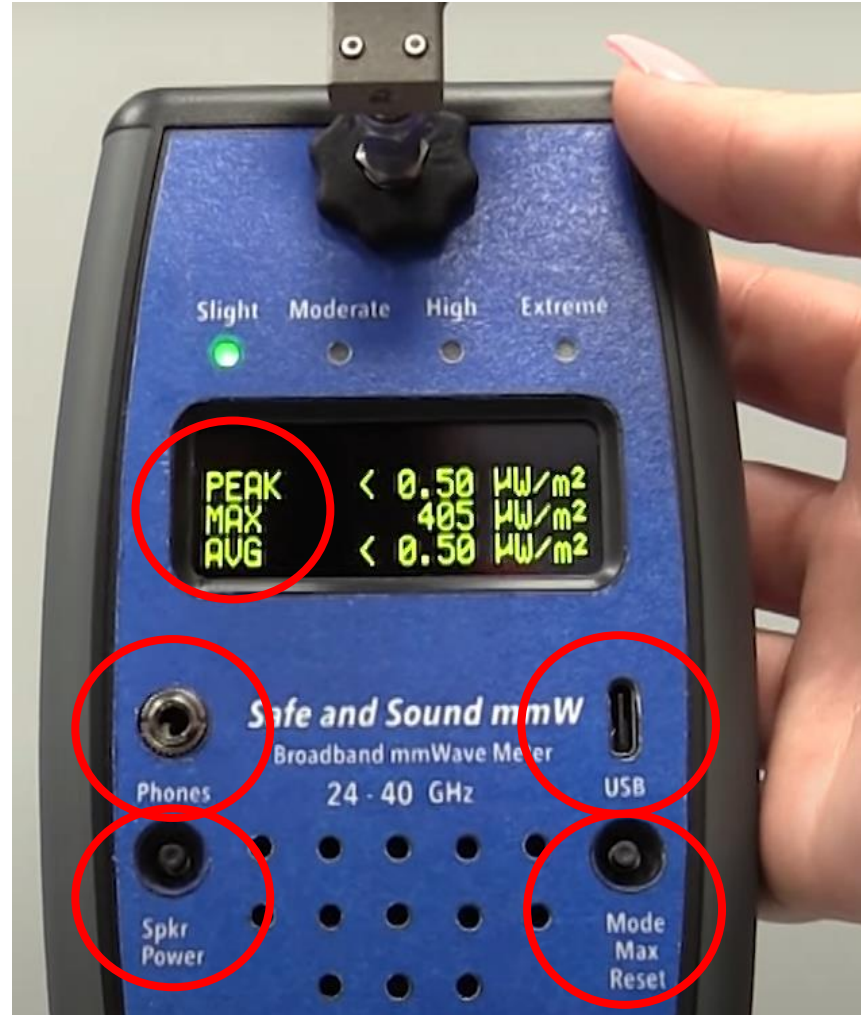
Average

Headphone Jack

3.5mm

Speaker/Sound 3 levels

Power



Power via USB Port
Continuous monitoring

Mode to select
Antennas

Max Reset

Hold to change units of
Measurement $\mu\text{W}/\text{m}^2$
to V/m

S & S Pro mm Wave Meter – Future Meters

Some Possible Options:

(200MHz – 8 GHz) + (20 GHz – 40 GHz)

8 GHz - 20 GHz

40 - 60 GHz – (60 GHz = High Band WiFi)

60 GHz - 90 GHz - (75 GHz = Car Radar)

Send us your suggestions!



EMF Meter – Safe and Sound EM3



Frequency Range – 50 Hz to (100kHz-150kHz) – Final testing required

- 3 in 1 Low Frequency meter: AC electric, AC magnetic fields and Body voltage
- Developed and made in North America – Professional Level
- Accurate – 3rd party certified +/- 0.5 dB or better (Final testing required)
- The perfect companion to Safe and Sound Pro II RF Meter
- More cost effective than the NFA1000
- Digital OLED display
- Powered by battery or USB power for continuous monitoring
- Common Sources: AC power lines, home electrical wiring, appliances and anything that consumes AC Power

Features:

3 axis Mag Meter

1 Axis E Meter

Body Voltage Meter

Cost: \$599 USD Release Date: Aug 2023 approx.

[Check website for more details!](#)

Thank you!

**For attending today's session
To all of our Beta Testers
And for considering adding these meters
to your EMF Tool Kit**



Rob Metzinger