

# RF Exposure Report

**Project Number:** 5024907                      **Proposal Number:** SUW-202302004058

**Report Number:** 5024907EMC08              **Revision Level:** 1

**Client:** Envovate Medical, LLC

**Equipment Under Test:** Wireless Medical Cart

**Model Name:** Envoy 2.0

**Model Number:** Phosphate – ENV-1DCAC0-A00  
Mobius – ENV-2DCAC1-A00

**FCC ID:** 2AQ9D-A0002945

**Contains FCC ID:** 2AQ9D-ENV2SOM

**Applicable Standards:** 47 CFR §§ 2.1093 (Portable)

FCC KDB 447498 D01 General RF Exposure Guidance v06

**Report revised on:** 30 October 2023

**Result:** Exempt from SAR evaluation



FOR THE SCOPE OF ACCREDITATION UNDER CERTIFICATE NUMBER: 3212.01

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

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## 1 General Information

### 1.1 Client Information

Name: Enovate Medical  
 Address: 1152 Park Avenue  
 City, State, Zip, Country: Murfreesboro, TN 37129, USA

### 1.2 Test Laboratory

Name: SGS North America, Inc.  
 Address: 620 Old Peachtree Road NW, Suite 100  
 City, State, Zip, Country: Suwanee, GA 30024, USA

Accrediting Body: A2LA  
 Type of lab: Testing Laboratory  
 Certificate Number: 3212.01

### 1.3 General Information of EUT

Type of Product: Wireless Medical Cart  
 Model Name: Envoy 2.0  
 Model Number: Phosphate – ENV-1DCAC0-A00  
 Mobius – ENV-2DCAC1-A00  
 Serial Number: 3193746  
 Module Model: ENV2SOM

Frequency Ranges: 2402 – 2480 MHz (Bluetooth/BLE)  
 2412 – 2462 MHz (WLAN 2.4GHz)  
 5180 – 5240 MHz (WLAN 5GHz U-NII-1)  
 5260 – 5320 MHz (WLAN 5GHz U-NII-2A)  
 5500 – 5720 MHz (WLAN 5GHz U-NII-2C)  
 5745 – 5825 MHz (WLAN 5GHz U-NII-3)

Antenna: Trace, 2402-2462MHz, 3.5dBi\*  
 Trace, 5180 – 5825MHz, 2.3dBi\*  
 External Whip, 2400-2480MHz, 0.7 dBi\*

Max Conducted Output Power: Bluetooth BDR: 4.91 dBm\*  
 Bluetooth LE: 0.16 dBm\*  
 WLAN 2.4GHz: 13.4 dBm\*  
 WLAN 5GHz U-NII-1: 14.39 dBm\*  
 WLAN 5GHz U-NII-2A: 14.5 dBm\*  
 WLAN 5GHz U-NII-2C: 13.3 dBm\*  
 WLAN 5GHz U-NII-3: 13.3 dBm\*

Sample Received Date: 07 March 2023

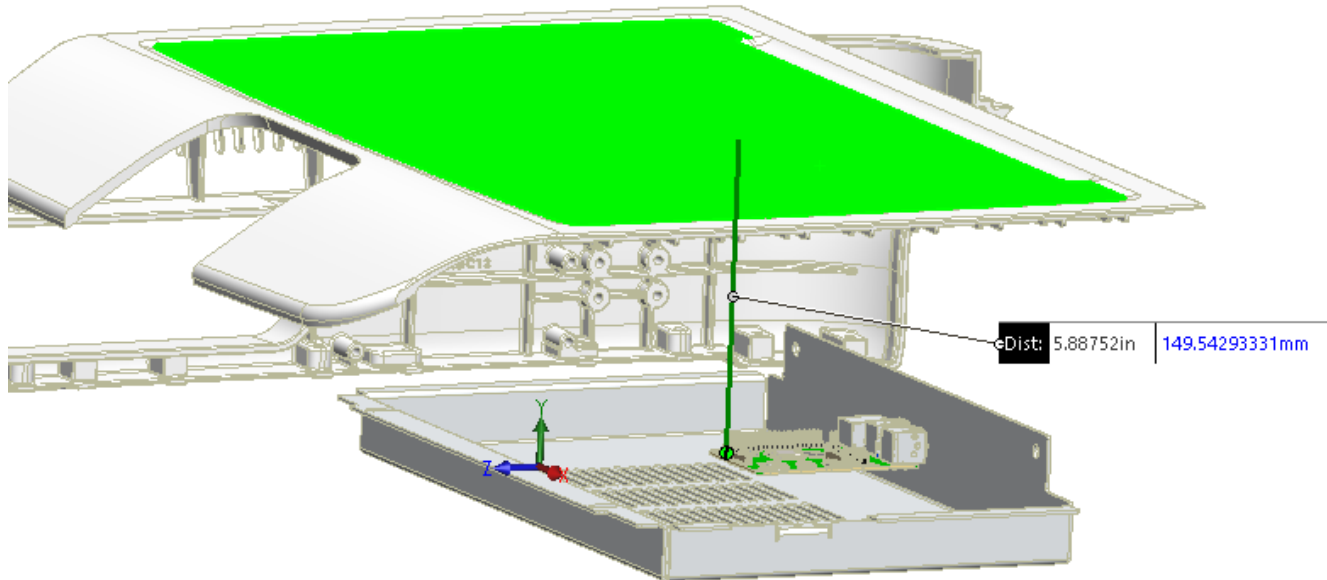
Dates of testing: 02-3 May 2023

*\*Data was not measured by SGS laboratory and therefore not responsible for accuracy. Data obtained via customer, specification sheet, previous regulatory filing or other.*

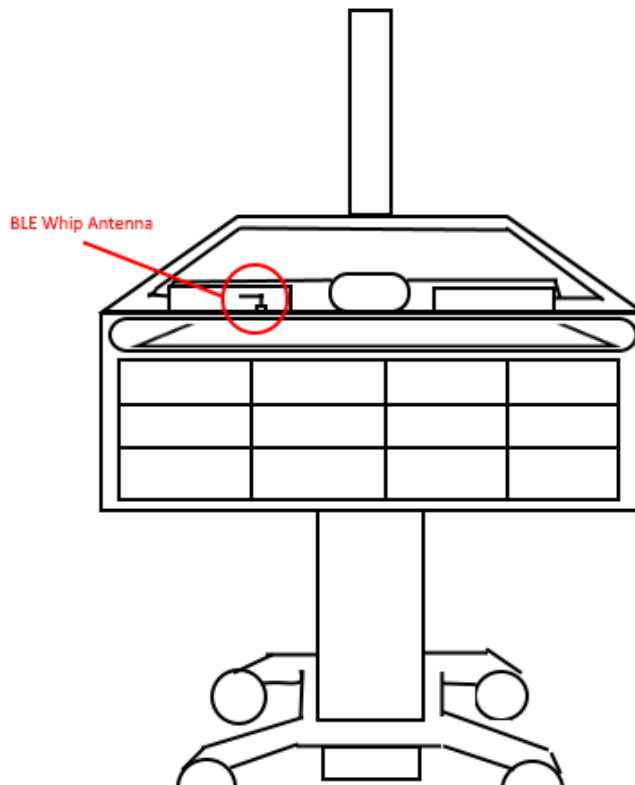
### 1.4 Separation Distance

The closest exposure distance occurs when a user places his or her hand on the top flat surface of the device. See mechanical drawings for reference.

WLAN/BDR antenna is situated 149.5mm from the top cover.



The closest exposure distance for the BLE external whip antenna occurs when a user places their hand on top of the work surface directly above the antenna. BLE external whip antenna is situated 13-25mm from the top cover.



### 1.5 Operating Modes and Conditions

Maximum power levels were utilized for all calculations. Simultaneous transmissions are possible between Bluetooth WLAN and BLE.

## 2 SAR Exclusion Calculations

The highest conducted output power in conjunction with the Upper and Lower frequency boundaries have been used to demonstrate compliance for both WLAN and Bluetooth transmission mode.

Power levels were referenced from measurements captured in report number 5024907EMC03.

The EUT is considered an extremity application.

### Nordic External Bluetooth LE (2AQ9D-A0002945)

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SAR test exclusion calculations

Section 4.3: General SAR test exclusion guidance / Section 4.3.1: Standalone SAR test exclusion considerations

	Input	Select Units	
Max Power:	0.16	dBm	
Duty Cycle:	100.0%		<== Source based time average duty cycle
Min separation distance:	5	mm	
Frequency, f:	2480	MHz	

Value reference Number	Values used for Calculation	Reference number definition
v1	1.00 mW	[max. power of channel, including tune-up tolerance, mW] 'Rounded to nearest mW
v2	5 mm	[min. test separation distance, mm] 'Rounded to nearest mm
v3	1.575	[√f(GHz)]

- a) For 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:  

$$\frac{[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0 \text{ for 1-g SAR, and } \leq 7.5 \text{ for 10-g extremity SAR,}$$

Exclusion Calculation(1g):	0.3	number	<== [v2 / v3] must be less than 3
Exclusion Calculation(10g):	0.3	number	<== [v2 / v3] must be less than 7.5

<b>Conclusions (Body):</b>	The EUT max power is BELOW the threshold. SAR Testing is NOT required for Body applications
<b>Conclusions (Extremity):</b>	The EUT max power is BELOW the threshold. SAR Testing is NOT required for Extremity applications

**Bluetooth BDR (2AQ9D-ENV2SOM)**

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SAR test exclusion calculations

Section 4.3: General SAR test exclusion guidance / Section 4.3.1: Standalone SAR test exclusion considerations

	Input	Select Units	
Max Power:	4.91	dBm	
Duty Cycle:	100.0%		<== Source based time average duty cycle
Min separation distance:	30	mm	
Frequency, f:	2441	MHz	

Value reference Number	Values used for Calculation	Reference number definition
v1	3.00 mW	[max. power of channel, including tune-up tolerance, mW] 'Rounded to nearest mW
v2	30 mm	[min. test separation distance, mm] 'Rounded to nearest mm
v3	1.562	[√f(GHz)]

a) For 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:  

$$\frac{[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}]}{10} \leq 3.0 \text{ for 1-g SAR, and } \leq 7.5 \text{ for 10-g extremity SAR,}$$

Exclusion Calculation(1g):	0.2	number	<== [v2 / v3] must be less than 3
Exclusion Calculation(10g):	0.2	number	<== [v2 / v3] must be less than 7.5

<b>Conclusions (Body):</b>	The EUT max power is BELOW the threshold. SAR Testing is NOT required for Body applications
<b>Conclusions (Extremity):</b>	The EUT max power is BELOW the threshold. SAR Testing is NOT required for Extremity applications

**WLAN 2.4GHz: (2AQ9D-ENV2SOM)**

447498 D01 General RF Exposure Guidance v06

SAR test exclusion calculations

Section 4.3: General SAR test exclusion guidance / Section 4.3.1: Standalone SAR test exclusion considerations

	Input	Select Units	
Max Power:	13.4	dBm	
Duty Cycle:	100.0%		<== Source based time average duty cycle
Min separation distance:	30	mm	
Frequency, f:	2462	MHz	

Value reference Number	Values used for Calculation	Reference number definition
v1	22.00 mW	[max. power of channel, including tune-up tolerance, mW] 'Rounded to nearest mW
v2	30 mm	[min. test separation distance, mm] 'Rounded to nearest mm
v3	1.569	[√f(GHz)]

a) For 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:  

$$\frac{[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}]}{10} \leq 3.0 \text{ for 1-g SAR, and } \leq 7.5 \text{ for 10-g extremity SAR,}$$

Exclusion Calculation(1g):	1.2	number	<== [v2 / v3] must be less than 3
Exclusion Calculation(10g):	1.2	number	<== [v2 / v3] must be less than 7.5

<b>Conclusions (Body):</b>	The EUT max power is BELOW the threshold. SAR Testing is NOT required for Body applications
<b>Conclusions (Extremity):</b>	The EUT max power is BELOW the threshold. SAR Testing is NOT required for Extremity applications

**WLAN 5GHz U-NII-1: (2AQ9D-ENV2SOM)**

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SAR test exclusion calculations

Section 4.3: General SAR test exclusion guidance / Section 4.3.1: Standalone SAR test exclusion considerations

	Input	Select Units	
Max Power:	14.39	dBm	
Duty Cycle:	100.0%		<== Source based time average duty cycle
Min separation distance:	149	mm	
Frequency, f:	5240	MHz	

Value reference Number	Values used for Calculation	Reference number definition
v1	27.00 mW	[max. power of channel, including tune-up tolerance, mW] 'Rounded to nearest mW
v2	149 mm	[min. test separation distance, mm] 'Rounded to nearest mm
v3	2.289	[f/(GHz)]

- b) For 100 MHz to 6 GHz and test separation distances > 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following (also illustrated in Appendix B)
- 1) {[Power allowed at numeric threshold for 50 mm in step a)] + [(test separation distance – 50 mm)·(f/(MHz)/150)]} mW, for 100 MHz to 1500 MHz
  - 2) {[Power allowed at numeric threshold for 50 mm in step a)] + [(test separation distance – 50 mm)·10]} mW, for > 1500 MHz and ≤ 6 GHz

Value reference Number	Values used for Calculation	Reference number definition
v4 <sub>1g</sub>	66 mW	<== 3 * 50 / V3 '[Power allowed at numeric threshold of 3.0 for 50 mm in step a)]
v4 <sub>10g</sub>	164 mW	<== 7.5 * 50 / V3 '[Power allowed at numeric threshold of 7.5 for 50 mm in step a)]
v5	99 mm	[(test separation distance – 50 mm)]
v6	10.00	10 for >1500 MHz and <6 GHz

1g Exclusion Threshold:	1056 mW	<== v4 <sub>1g</sub> + (v5 * v6)
10g Exclusion Threshold:	1154 mW	<== v4 <sub>10g</sub> + (v5 * v6)

Conclusions:	The EUT max power is BELOW the threshold. SAR Testing is NOT required for Body applications
	The EUT max power is BELOW the threshold. SAR Testing is NOT required for Extremity applications

**WLAN 5GHz U-NII-2A: (2AQ9D-ENV2SOM)**

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SAR test exclusion calculations

Section 4.3: General SAR test exclusion guidance / Section 4.3.1: Standalone SAR test exclusion considerations

	Input	Select Units	
Max Power:	14.5	dBm	
Duty Cycle:	100.0%		<== Source based time average duty cycle
Min separation distance:	149	mm	
Frequency, f:	5320	MHz	

Value reference Number	Values used for Calculation	Reference number definition
v1	28.00 mW	[max. power of channel, including tune-up tolerance, mW] 'Rounded to nearest mW
v2	149 mm	[min. test separation distance, mm] 'Rounded to nearest mm
v3	2.307	[f/(GHz)]

- b) For 100 MHz to 6 GHz and test separation distances > 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following (also illustrated in Appendix B)
- 1) {[Power allowed at numeric threshold for 50 mm in step a)] + [(test separation distance – 50 mm)·(f/(MHz)/150)]} mW, for 100 MHz to 1500 MHz
  - 2) {[Power allowed at numeric threshold for 50 mm in step a)] + [(test separation distance – 50 mm)·10]} mW, for > 1500 MHz and ≤ 6 GHz

Value reference Number	Values used for Calculation	Reference number definition
v4 <sub>1g</sub>	65 mW	<== 3 * 50 / V3 '[Power allowed at numeric threshold of 3.0 for 50 mm in step a)]
v4 <sub>10g</sub>	163 mW	<== 7.5 * 50 / V3 '[Power allowed at numeric threshold of 7.5 for 50 mm in step a)]
v5	99 mm	[(test separation distance – 50 mm)]
v6	10.00	10 for >1500 MHz and <6 GHz

1g Exclusion Threshold:	1055 mW	<== v4 <sub>1g</sub> + (v5 * v6)
10g Exclusion Threshold:	1153 mW	<== v4 <sub>10g</sub> + (v5 * v6)

Conclusions:	The EUT max power is BELOW the threshold. SAR Testing is NOT required for Body applications
	The EUT max power is BELOW the threshold. SAR Testing is NOT required for Extremity applications

**WLAN 5GHz U-NII-2C: (2AQ9D-ENV2SOM)**

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## SAR test exclusion calculations

Section 4.3: General SAR test exclusion guidance / Section 4.3.1: Standalone SAR test exclusion considerations

	Input	Select Units	
Max Power:	13.3	dBm	
Duty Cycle:	100.0%		<== Source based time average duty cycle
Min separation distance:	30	mm	
Frequency, f:	5720	MHz	

Value reference Number	Values used for Calculation	Reference number definition
v1	21.00 mW	[max. power of channel, including tune-up tolerance, mW] 'Rounded to nearest mW
v2	30 mm	[min. test separation distance, mm] 'Rounded to nearest mm
v3	2.392	[√f(GHz)]

- a) For 100 MHz to 6 GHz and test separation distances  $\leq 50$  mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:  
 $[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$  for 1-g SAR, and  $\leq 7.5$  for 10-g extremity SAR,

Exclusion Calculation(1g):	1.7	number	<== [v2 / v3] must be less than 3
Exclusion Calculation(10g):	1.7	number	<== [v2 / v3] must be less than 7.5

<b>Conclusions (Body):</b>	The EUT max power is BELOW the threshold. SAR Testing is NOT required for Body applications
<b>Conclusions (Extremity):</b>	The EUT max power is BELOW the threshold. SAR Testing is NOT required for Extremity applications

**WLAN 5GHz U-NII-3: (2AQ9D-ENV2SOM)**

## 447498 D01 General RF Exposure Guidance v06

## SAR test exclusion calculations

Section 4.3: General SAR test exclusion guidance / Section 4.3.1: Standalone SAR test exclusion considerations

	Input	Select Units	
Max Power:	13.3	dBm	
Duty Cycle:	100.0%		<== Source based time average duty cycle
Min separation distance:	30	mm	
Frequency, f:	5825	MHz	

Value reference Number	Values used for Calculation	Reference number definition
v1	21.00 mW	[max. power of channel, including tune-up tolerance, mW] 'Rounded to nearest mW
v2	30 mm	[min. test separation distance, mm] 'Rounded to nearest mm
v3	2.414	[√f(GHz)]

- a) For 100 MHz to 6 GHz and test separation distances  $\leq 50$  mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:  
 $[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$  for 1-g SAR, and  $\leq 7.5$  for 10-g extremity SAR,

Exclusion Calculation(1g):	1.7	number	<== [v2 / v3] must be less than 3
Exclusion Calculation(10g):	1.7	number	<== [v2 / v3] must be less than 7.5

<b>Conclusions (Body):</b>	The EUT max power is BELOW the threshold. SAR Testing is NOT required for Body applications
<b>Conclusions (Extremity):</b>	The EUT max power is BELOW the threshold. SAR Testing is NOT required for Extremity applications



## 2.1 ***Simultaneous Conditions***

Simultaneous transmissions are evaluated using the equation and highest results from each technology.

$$\frac{S_1}{S_1 \text{ Limit}} + \frac{S_2}{S_2 \text{ Limit}} \dots + \frac{S_n}{S_n \text{ Limit}} \leq 1.0$$

$$6.2\% (\text{UNII-2}) + 8\% (\text{BDR}) + 10\% (\text{BLE}) = 24.2\% (<100\%)$$

### 3 Revision History

Revision Level	Description of changes	Revision Date
0	Initial Release	19 September 2023
1	Updated section 1.3 & 2	30 October 2023