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COMMERCIAL-IN-CONFIDENCE

# SAR EXCLUSION DOCUMENT

Document 75946792-07 Issue 01

**HWM Water (on behalf of Fluid Conservation Systems (FCS)), Radio Transceiver, Model: Patroller 4**  
**In accordance with FCC Part 2.1093**

- 914.5 MHz 2-FSK transmitter
- 2.4 GHz Bluetooth transmitter

FCC Standalone SAR Test Exclusion Considerations (KDB 447498 D01) Section 4.3.1 a)

100 MHz – 6 GHz – Separation Distance ≤50 mm

The 1g SAR Test exclusion thresholds for 100 MHz to 6 GHz test separation distances ≤ 50 mm are determined by:

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

- f (GHz) is the RF channel transmit frequency in GHz.
- Power and distance are rounded to the nearest mW and mm before calculation.
- The result is rounded to one decimal place for comparison
- When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied.

Note: For combined exposure the sum of the SAR test exclusion thresholds has been applied.

SAR Exclusion Result:

Frequency (GHz)	Power Output mW	Duty Cycle %	Maximum Power (Tune up Value) * (mW)	Test Separation Distance (mm)	SAR Test Exclusion Threshold	Limit**	SAR Test Exclusion (Yes/No)
0.9145	1	1	0.01	5	0.0019	3.0	Yes
2.402	2	5	0.10	5	0.0310	3.0	Yes
Combined exposure sum					0.0329	3.0	Yes

\* Maximum power including tolerance of the time averaged declared conducted output power of the device.

\*\* Select ≤ 3.0 for 1g SAR and ≤ 7.5 for 10g extremity SAR.

The SAR exclusion threshold has been evaluated using the formula described above from information supplied by the manufacturer below. Based on the calculation above, the EUT is categorically excluded from SAR testing.

Approved by   
 .....  
**Jon Kenny**  
 Authorised Signatory

Date 28 November 2019  
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Manufacturer's Declaration of Product Information:

Technical Description: <i>(Please provide a brief description of the intended use of the equipment)</i>	The device is a wireless configuration and data download tool for HWM data loggers
Manufacturer:	HWM-Water Ltd – Branded Fluid Conservation Systems Inc. (FCS)
Model:	Patroller 4
Part Number:	PAT4/F/914/1

If more than one frequency band is supported, please confirm which combinations of bands are capable of Simultaneous Transmit.	The transmitters can operate simultaneously
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Frequency Band 1:

Antenna Model:	Nearson S463AM-915	
Antenna length:	17.6	cm
Bottom frequency:	N/A	MHz
Middle frequency:	914.5	MHz
Top frequency:	N/A	MHz

Maximum power (input to the antenna including a tolerance):	177	uW
Antenna gain (or maximum gain allowed):	2	dBi

Separation distance from antenna to the user/bystander	0	cm
Transmitter Duty Cycle:	1	%

Frequency Band 2:

Antenna Model:	BlueMod+S42M/AI	
Antenna length:	0.8	cm
Bottom frequency:	2402	MHz
Middle frequency:	2441	MHz
Top frequency:	2480	MHz

Maximum power (input to the antenna including a tolerance):	2	mW
Antenna gain (or maximum gain allowed):	2	dBi

Separation distance from antenna to the user/bystander	0	cm
Transmitter Duty Cycle:	5	%