



**FCC CFR47 PART 15 SUBPART C
CERTIFICATION**

TEST REPORT

FOR

THE FUEL WEB, INC.

DATA MODULE

MODEL: DM-SHRF-1

FCC ID: PX5-DTA1001

REPORT NUMBER: 04U2623-1

ISSUE DATE: APRIL 21, 2004

Prepared for
THE FUEL WEB, INC.
21614 NE 173RD AVE.
BATTLE GROUND
WA 98604, USA

Prepared by
COMPLIANCE CERTIFICATION SERVICES
561F MONTEREY ROAD,
MORGAN HILL, CA 95037, USA
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1. TEST RESULT CERTIFICATION

COMPANY NAME: THE FUEL WEB
21614 NE 173RD AVE.
BATTLE GROUND, WA 98604, USA

EUT DESCRIPTION: DATA MODULE

MODEL: DM-SHRF-1

DATE TESTED: APRIL 19, 2004 – APRIL 21, 2004

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART C	NO NON-COMPLIANCE NOTED

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: This document reports conditions under which testing was conducted and results of tests performed. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document.

Approved & Released For CCS By:



THU CHAN
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

Tested By:



THANH NGUYEN
EMC TECHNICIAN
COMPLIANCE CERTIFICATION SERVICES

2. EUT DESCRIPTION

The Fuel Web's propane tank monitoring system consists of three main functions, a Data Module (DM), a Gateway Module (GM), and the Gateway Server (GWS). The DM is installed on the customer's propane tank and is powered by a solar cell, battery, and large storage capacitor. The battery allows operation when there is insufficient stored solar power.

The DM takes readings of the tank level, exterior temperature, and internal power periodically. Every six readings, or whenever it detects an anomaly, it will transfer the appropriate data to the GM.

The DM will check periodically for a number of anomalies – excessive propane usage, tank filled, low propane level, etc. The DM will notify the GM immediately upon detection of any of these conditions.

UNIT	Frequency Band (MHz)	Peak Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)
DM	905	92.98	94.00	-1.02

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4/1992, FCC CFR 47 Part 2 and FCC CFR 47 Part 15.

4. FACILITIES AND ACCREDITATION

The open area test sites and conducted measurement facilities used to collect data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.



No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government.

5. CALIBRATION AND UNCERTAINTY

5.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

5.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Radiated Emission, 30 to 200 MHz	+/- 3.3 dB
Radiated Emission, 200 to 1000 MHz	+4.5 / -2.9 dB
Radiated Emission, 1000 to 2000 MHz	+4.5 / -2.9 dB
Power Line Conducted Emission	+/- 2.9 dB

Uncertainty figures are valid to a confidence level of 95%.

5.3. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
Quasi-Peak Adaptor	HP	85650A	2521A01038	7/16/04
SA Display Section 3	HP	85662A	2314A04793	7/16/04
SA RF Section, 1.5 GHz	HP	85680A	2314A02604	7/16/04
Site C Preamplifier, 1300MHz	HP	8447D	2944A06550	8/18/04
Antenna, Biconical	Eaton	94455-1	1214	3/8/05
Antenna, Log Periodic 200 ~ 1000 MHz	EMCO	3146	9107-3163	3/8/05
LISN, 10 kHz ~ 30 MHz	FCC	50/250-25-2	114	10/13/04
Site A Line Stabilizer / Conditioner	Tripplite	LC-1800a	A0051681	CNR
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BNC	8379443	10/13/04
EMI Test Receiver	R & S	ESHS 20	827129/006	7/17/04
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	6717	2/4/05
Preamplifier, 1 ~ 26 GHz	Miteq	NSP10023988	646456	4/25/04
Spectrum Analyzer	HP	E8953EM	3710A00205	10/01/04

6. SETUP OF EQUIPMENT UNDER TEST

SUPPORT EQUIPMENT

None

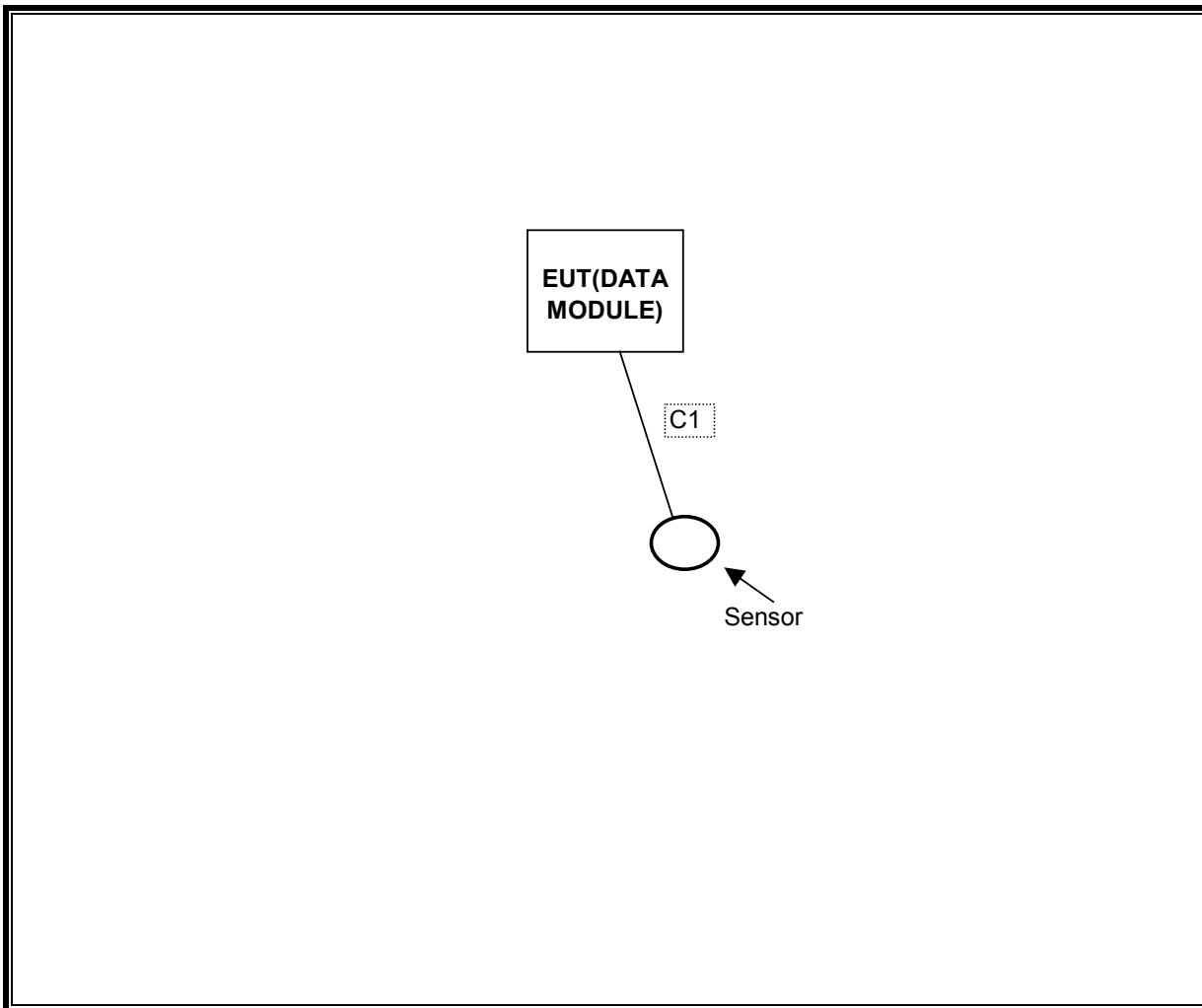
I/O CABLES

TEST I / O CABLES								
Cable No	I/O Port	# of I/O Port	Connector Type	Type of Cable	Cable Length	Data Traffic	Bundled	Remark
1	Sensor	1	BNC	Unshielded	1m	No	No	N/A

TEST SETUP

The Data Module is a standalone device, was activated by program set up to transmit continuously mode.

SETUP DIAGRAM FOR TESTS



7. APPLICABLE LIMITS AND TEST RESULTS

7.1. RADIATED EMISSIONS

LIMITS

§15.249 Operation within the bands 902 - 928 MHz, 2400 - 2483.5 MHz, 5725 - 5875 MHz, and 24.0 - 24.25 GHz.

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
902 - 928 MHz	50	500
2400 - 2483.5 MHz	50	500
5725 - 5875 MHz	50	500
24.0 - 24.25 GHz	250	2500

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

§15.209 In the emission table above, the tighter limit applies at the band edges.

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane, the X, Y, and Z positions (if necessary) shall be tested and the worst case reported. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The transmitter shall be switched on with typical modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to 905MHz signal.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

RESULTS

No non-compliance noted:

FUNDAMENTAL MEASUREMENT:

COMPLIANCE Certification Services		Project Report		04U2623-1							
		Date & TestEngr		040419C2							
				04/19/04 1:36 PM							
				Thanh Nguyen							
FCC, VCCI, CISPR, CE, AUSTEL, NZ UL, CSA, TUV, BSMI, DHHS, NVLAP											
561F MONTEREY ROAD, SAN JOSE, CA 95037-9001 PHONE: (408) 463-0885 FAX: (408) 463-0888											
Company: The Fuel Web, INC.											
EUT Description: Data Module											
Test Configuration: EUT Stand Alone											
Type of Test: FCC Part 15 Class B, RSS-210 IC											
Mode of Operation: Transmitting											
Data Entry		<input type="checkbox"/> C-Ste Pream		<input type="radio"/> FCC_A <input checked="" type="radio"/> FCC_B <input type="radio"/> EN_A <input type="radio"/> EN_B <input type="radio"/> EN11B_G2							
Freq. (MHz)	Reading (dBuV)	AF (dB)	Closs (dB)	Pre-amp (dB)	Level (dBuV/m)	Limit FCC_B	Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter)	Mark (P/Q/A)
EUT at Y Position											
905.00	64.60	23.25	5.13	0.00	92.98	94.00	-1.02	3mV	0.00	1.00	P
905.00	54.70	23.25	5.13	0.00	83.08	94.00	-12.92	3mH	0.00	1.50	P
EUT at X Position											
905.00	55.80	23.25	5.13	0.00	84.18	94.00	-11.82	3mH	0.00	1.50	P
905.00	52.50	23.25	5.13	0.00	80.88	94.00	-15.12	3mV	0.00	1.50	P
EUT at Z Position											
905.00	57.90	23.25	5.13	0.00	86.28	94.00	-9.72	3mV	0.00	1.50	P
905.00	58.20	23.25	5.13	0.00	86.58	94.00	-9.42	3mH	0.00	1.50	P

HARMONICS AND SPURIOUS EMISSIONS

04/19/04 High Frequency Measurement Compliance Certification Services, Morgan Hill Open Field Site																																																																																																	
Test Engr: Thanh Nguyen Project #: 04U2623-1 Company: The Fuel Web, INC. EUT Descrip.: DATA Module 905MHz Transceiver. EUT M/N: DM-SHRF-1 Test Target: FCC part 15 Class B, RSS 210 IC Mode Oper: Transmit mode, at Worst Position (Y Position)																																																																																																	
Test Equipment:																																																																																																	
EMCO Horn 1-18GHz			Spectrum Analyzer			Pre-amplifier 1-26GHz			Pre-amplifier 26-40GHz			Horn > 18GHz																																																																																					
T73; S/N: 6717 @3m			HP 8593EM Analyzer			T63 Miteq 646456																																																																																											
Hi Frequency Cables <input checked="" type="checkbox"/> (2 ft) <input type="checkbox"/> (2 ~ 3 ft) <input type="checkbox"/> (4 ~ 6 ft) <input checked="" type="checkbox"/> (12 ft)																																																																																																	
Peak Measurements: 1 MHz Resolution Bandwidth 1MHz Video Bandwidth																																																																																																	
Average Measurements: 1 MHz Resolution Bandwidth 10Hz Video Bandwidth																																																																																																	
<table border="1"><thead><tr><th>f GHz</th><th>Dist feet</th><th>Read Pk dBuV</th><th>Read Avg. dBuV</th><th>AF dB/m</th><th>CL dB</th><th>Amp dB</th><th>D Corr dB</th><th>HPF</th><th>Peak dBuV/m</th><th>Avg dBuV/m</th><th>Pk Lim dBuV/m</th><th>Avg Lim dBuV/m</th><th>Pk Mar dB</th><th>Avg Mar dB</th><th>Notes</th></tr></thead><tbody><tr><td>1.810</td><td>9.8</td><td>60.2</td><td>57.7</td><td>27.3</td><td>1.9</td><td>-36.4</td><td>0.0</td><td>1.0</td><td>53.9</td><td>51.4</td><td>74.0</td><td>54.0</td><td>-20.1</td><td>-2.6</td><td>V</td></tr><tr><td>2.715</td><td>9.8</td><td>48.8</td><td>40.2</td><td>29.9</td><td>2.3</td><td>-35.9</td><td>0.0</td><td>1.0</td><td>46.2</td><td>37.5</td><td>74.0</td><td>54.0</td><td>-27.8</td><td>-16.5</td><td>V</td></tr><tr><td>1.810</td><td>9.8</td><td>54.5</td><td>50.5</td><td>27.3</td><td>1.9</td><td>-36.4</td><td>0.0</td><td>1.0</td><td>48.2</td><td>44.2</td><td>74.0</td><td>54.0</td><td>-25.8</td><td>-9.8</td><td>H</td></tr><tr><td>2.715</td><td>9.8</td><td>50.8</td><td>46.2</td><td>29.9</td><td>2.3</td><td>-35.9</td><td>0.0</td><td>1.0</td><td>48.2</td><td>43.5</td><td>74.0</td><td>54.0</td><td>-25.8</td><td>-10.5</td><td>H</td></tr></tbody></table>																		f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes	1.810	9.8	60.2	57.7	27.3	1.9	-36.4	0.0	1.0	53.9	51.4	74.0	54.0	-20.1	-2.6	V	2.715	9.8	48.8	40.2	29.9	2.3	-35.9	0.0	1.0	46.2	37.5	74.0	54.0	-27.8	-16.5	V	1.810	9.8	54.5	50.5	27.3	1.9	-36.4	0.0	1.0	48.2	44.2	74.0	54.0	-25.8	-9.8	H	2.715	9.8	50.8	46.2	29.9	2.3	-35.9	0.0	1.0	48.2	43.5	74.0	54.0	-25.8	-10.5	H
f GHz	Dist feet	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes																																																																																		
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No more Harmonic and Spurious emissions above 2.715GHz.																																																																																																	
<table><tr><td>f</td><td>Measurement Frequency</td><td>Amp</td><td>Preamp Gain</td><td>Avg Lim</td><td>Average Field Strength Limit</td></tr><tr><td>Dist</td><td>Distance to Antenna</td><td>D Corr</td><td>Distance Correct to 3 meters</td><td>Pk Lim</td><td>Peak Field Strength Limit</td></tr><tr><td>Read</td><td>Analyzer Reading</td><td>Avg</td><td>Average Field Strength @ 3 m</td><td>Avg Mar</td><td>Margin vs. Average Limit</td></tr><tr><td>AF</td><td>Antenna Factor</td><td>Peak</td><td>Calculated Peak Field Strength</td><td>Pk Mar</td><td>Margin vs. Peak Limit</td></tr><tr><td>CL</td><td>Cable Loss</td><td>HPF</td><td>High Pass Filter</td><td></td><td></td></tr></table>																		f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit	Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit	Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit	AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit	CL	Cable Loss	HPF	High Pass Filter																																																				
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7.1.1. WORST-CASE RADIATED EMISSIONS BELOW 1 GHZ

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION)

 COMPLIANCE Certification Services		Project #: 04U2623-1 Report #: 040419C2 Date & Time: 04/19/04 1:36 PM Test Engr: Thanh Nguyen									
FCC, VCCI, CISPR, CE, AUSTEL, NZ UL, CSA, TUV, BSMI, DHHS, NVLAP		561F MONTEREY ROAD, SAN JOSE, CA 95037-9001 PHONE: (408) 463-0885 FAX: (408) 463-0888									
Company: The Fuel Web, INC. EUT Description: Data Module Test Configuration: EUT at worst position (Y Position) Type of Test: FCC Part 15 Class B, RSS-210 IC Mode of Operation: Transmitting		<< Main Sheet									
Freq. (MHz)	Reading (dBuV)	AF (dB)	Closs (dB)	Pre-amp (dB)	Level (dBuV/m)	Limit FCC_B	Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter)	Mark (P/Q/A)
141.54	48.00	15.52	1.90	27.01	38.42	43.50	-5.08	3mH	0.00	1.50	P
339.49	48.50	15.90	2.88	26.70	40.58	46.00	-5.42	3mV	0.00	1.00	P
396.08	48.30	16.23	3.15	27.10	40.58	46.00	-5.42	3mH	0.00	1.50	P
282.90	48.90	14.60	2.61	26.44	39.67	46.00	-6.33	3mV	180.00	1.00	P
193.00	46.60	13.57	2.16	26.74	35.59	43.50	-7.91	3mV	0.00	1.00	P
49.00	45.80	12.06	1.16	27.34	31.68	40.00	-8.32	3mV	0.00	1.00	P
6 Worst Data											

8. SETUP PHOTOS

RADIATED MEASUREMENT SETUP





END OF REPORT