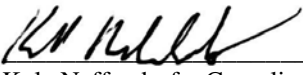





CURTIS-STRAUS

# Test Report

Report No	EI0285-3
Client	Ohio Willow Wood 15441 Scioto Darby Rd. Mt. Sterling, OH 43143
Phone	800-553-3445
FRN	0016158792
Model	OWWCO Transceiver Module PN.6221020 V1.1X
FCC ID	U3V6221020
Equipment Type Equipment Code	Low Power Communications Device Transceiver DXT
Results	As detailed within this report
Prepared by	 Kyle Neffendorf – Compliance Engineer
Authorized by	 Michael Buchholz – EMC Manager
Issue Date	7/11/08
Conditions of issue	This Test Report is issued subject to the conditions stated in 'terms and conditions' section of this report.

Curtis-Straus LLC is accredited by the American Association for Laboratory Accreditation for the specific scope of accreditation under Certificate Number 1627-01. This report may contain data which is not covered by the A2LA accreditation.

**Curtis-Straus** LLC • 527 Great Road • Littleton, MA • TEL (978) 486-8880 • FAX (978) 486-8828



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## ***Summary***

This test report supports a Class II Permissive Change of a transmitter operating with a Limited Modular Approval pursuant to 47 CFR 15.249. The previous Class II Permissive Change of the Ohio Willow Wood Radio Module (Model 6221020 V1.1X) contained a ferrite emission suppressor on the AC Line.

This implies that the module's status of approval is conditional upon limiting it's installation to AC powered devices with a ferrite emission suppressor. That condition of implementation must be removed from the Limited Modular Approval.

AC Line Conducted Emissions were tested against the AC Line conducted emissions limits outlined in 47 CFR 15.207. Testing was performed on the Ohio Willow Wood Four hole vacuum pump which contains the Ohio Willow Wood Radio Module Device, which utilizes FCC ID U3V6221020.

## ***Statement of Conformity***

The Ohio Willow Wood Radio Module (Model 6221020 V1.1X) has been found to comply with the line conducted emissions limits specified in 47 CFR 15.207.

## ***Test Methodology***

Conducted emission testing was performed according to the procedures in ANSI C63.4 (2003). The testing was performed using a 50  $\mu$ H/50  $\Omega$  Line Impedance Stabilization Network. The device's performance was investigated in the range 0.15 – 30 MHz.

**EUT Configuration**

<b>EUT Configuration</b>				
<b>Work Order:</b> H0043				
<b>Company:</b> Ohio Willow Wood Co				
<b>Company Address:</b> 15441 Scioto Darby Rd. Mt. Sterling, OH 43143				
<b>Contact:</b> Mike Haynes				
<b>Person Present:</b> Mike Haynes				
<b>MN</b>		<b>SN</b>		
<b>EUT:</b> 6221020 V1.1X		Test Samples 1-4		
<b>EUT Description:</b> OWWCO Radio Module				
<b>EUT Max Frequency:</b> 2.40-2.48GHz				
<b>Support Equipment:</b>	<b>MN</b>	<b>SN</b>		
Four Hole Vacuum Pump	LLV-01040	732952260		
Charge Indicator	LLV-01010	PN-1988-B		
GlobTek Inc Medical p/s	GTM41060-1505	WR9QA2600A00-N-MED		
<b>EUT Cables:</b>	<b>Qty</b>	<b>Shielded?</b>	<b>Length</b>	<b>Ferrites</b>
Indicator to Vacuum	1	no	1.5ft	None
Adapter to Indicator	1	no	26ft	None
<b>Unpopulated EUT Ports:</b>	<b>Qty</b>	<b>Reason</b>		
None				
<b>Software / Operating Mode Description:</b>				
2.4GHz Direct Sequence Hopping Low Power Radio Transceiver.				

**Test Equipment Used**

REV. 26-NOV-2007

<b>SPECTRUM ANALYZERS / RECEIVERS</b>	<b>RANGE</b>	<b>MN</b>	<b>MFR</b>	<b>SN</b>	<b>ASSET</b>	<b>CAT</b>	<b>CALIBRATION DUE</b>
GOLD	100Hz-26.5 GHz	E4407B	Agilent	MY45113816	1284	I	25-JUL-2008
<b>LISNS/MEASUREMENT PROBES</b>	<b>RANGE</b>	<b>MN</b>	<b>MFR</b>	<b>SN</b>	<b>ASSET</b>	<b>CAT</b>	<b>CALIBRATION DUE</b>
YELLOW-BLACK	30kHz-50MHz	8012-50-R-24-BNC	SOLAR	0411657	00248	I	28-MAY-2009
<b>CONDUCTED TEST SITES (MAINS / TELCO)</b>	<b>FCC CODE</b>	<b>IC CODE</b>	<b>VCCI CODE</b>	<b>CAT</b>	<b>CALIBRATION DUE</b>		
EMI 3	93448	N/A	C-1803, T-270	III	NA		

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

**Conducted Emissions Measurements****LIMIT**

Frequency of emission (MHz)	Quasi-peak limit (dB $\mu$ V)	Average limit (dB $\mu$ V)
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\*decreases with the logarithm of frequency.

**Note:** If peak measurements meet the Average limit, then Average measurements are not required.

**MEASUREMENTS**

AC Mains Conducted Emissions							Curtis-Straus LLC				
Date: 06-Jun-08			Company: Ohio Willow Wood			Work Order: 10285					
Engineer: Kyle Neffendorf			EUT Desc: USB Module			Test Site: EMI 3					
Notes:											
Measurement Device: Yellow-Black LISN						EUT Operating Voltage/Frequency: 120V60Hz					
Range: 0.15-30MHz						Spectrum Analyzer: Gold					
Frequency (MHz)	Q.P. Readings		Ave. Readings		Impedance Factor	FCC/CISPR B		FCC/CISPR B		Overall Result (Pass/Fail)	
	QP1 (dBµV)	QP2 (dBµV)	AV1 (dBµV)	AV2 (dBµV)		qp Limit (dBµV)	qp Margin dB	AVE Limit (dBµV)	AVE Margin dB		
0.16	27.4	28.3	14.0	12.9	20.5	65.5	-16.7	55.5	-21.0	Pass	
0.18	24.8	22.0	12.6	10.7	20.4	64.5	-19.3	54.5	-21.5	Pass	
0.19	23.3	29.8	11.9	12.6	20.4	64.0	-13.8	54.0	-21.0	Pass	
0.23	30.6	30.1	8.9	9.6	20.4	62.4	-11.4	52.4	-22.4	Pass	
0.26	34.0	33.1	11.8	12.0	20.3	61.4	-7.1	51.4	-19.1	Pass	
0.70	16.0	17.0	0.0	4.8	20.1	56.0	-18.9	46.0	-21.1	Pass	
Table Result:		Pass	by	-7.10 dB		Worst Freq:		0.26 MHz			

## Measurement Uncertainty

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

Measurement	Expanded Uncertainty k=2	Maximum allowable uncertainty (ETSI)
Radiated Emissions (30-1000MHz)	5.6dB	N/A
Radiated Emissions (1-26.5GHz)	4.6dB	N/A
Radiated Emissions (above 26.5GHz)	4.9dB	N/A
Magnetic Radiated Emissions	5.6dB	N/A
Conducted Emissions	3.9dB	N/A
Telco Conducted Emissions (Current)	2.9dB	N/A
Telco Conducted Emissions (Voltage)	4.4dB	N/A
Electrostatic Discharge	11.5%	N/A
Radiated RF Immunity (Uniform Field)	1.6dB	N/A
Electrical Fast Transients	23.1%	N/A
Surge	23.1%	N/A
Conducted RF Immunity	3dB	N/A
Magnetic Immunity	12.8%	N/A
Dips and Interrupts	2.3V	N/A
Harmonics	3.5%	N/A
Flicker	3.5%	N/A
Radio frequency	$8.2 \times 10^{-8}$	$1 \times 10^{-7}$
RF power, conducted	0.7dB	0.75dB
Maximum frequency deviation:		
• Within 300Hz and 6kHz of audio frequency	• 1.2%	• 5%
• Within 6kHz and 25kHz of audio frequency	• 0.1dB	• 3dB
Adjacent channel power	1.9dB	3dB
Conducted spurious emission of transmitter, valid up to 12.75GHz	0.7dB	3dB
Conducted emission of receivers	0.7dB	1dB
Radiated emission of transmitter, valid up to 26.5GHz	5.6dB	6dB
Radiated emission of transmitter, valid up to 80GHz	5.6dB	6dB
Radiated emission of receiver, valid up to 26.5GHz	5.6dB	6dB
Radiated emission of receiver, valid up to 80GHz	5.6dB	6dB
RF level uncertainty for a given BER	0.7dB	1dB
Humidity	2.31%	5%
Temperature	0.6°C	1.0°C
Time	0.8%	10%
RF Power Density, Conducted	2.2dB	3dB
DC and low frequency voltages	1.29%	3%
Voltage (AC, <10kHz)	1.29%	2%
Voltage (DC)	0.23%	1%
The above reflects a 95% confidence level		

## Conditions Of Testing

[Bureau Veritas Consumer Products Services, Inc., a Massachusetts corporation], and/or its affiliates (collectively, the "Company") will conduct, at the request of the Submitter ("Client"), the tests specified on the submitted Test Request Form or equivalent in accordance with, and subject to, the following terms and conditions (collectively, "Conditions"):

1. All orders for tests are subject to acceptance by the Company, and no order will constitute a binding commitment of the Company unless and until such order is accepted by it, as evidenced by the issuance of a written report ("Test Report") by the Company. The Test Report is issued solely by the Company, is intended for the exclusive use of Client and shall not be published, used for advertising purposes, copied or replicated for distribution to any other person or entity or otherwise publicly disclosed without the prior written consent of the Company. By submitting a request for services to the Company, Client consents to the disclosure to accreditation bodies of those records of Client relevant to the accreditation body's assessment of the Company's competence and compliance with relevant accreditation criteria. The Company shall not be liable for any loss or damage whatsoever resulting from the failure of the Company to provide its services within any time period for completion estimated by the Company. If Client anticipates using the Test Report in any legal proceeding, arbitration, dispute resolution forum or other proceeding, it shall so notify the Company prior to submitting the Test Report in such proceeding. The Company has no obligation to provide a fact or expert witness at such proceeding unless the Company agrees in advance to do so for a separate and additional fee.
2. The Test Report will set forth the findings of the Company solely with respect to the test samples identified therein. Unless specifically and expressly indicated in the Test Report, the results set forth in such Test Report are not intended to be indicative or representative of the quality or characteristics of the lot from which a test sample is taken, and Client shall not rely upon the Test Report as being so indicative or representative of the lot or of the tested product in general. The Test Report will reflect the findings of the Company at the time of testing only, and the Company shall have no obligation to update the Test Report after its issuance. The Test Report will set forth the results of the tests performed by the Company based upon the written information provided to the Company. The Test Report will be based solely on the samples and written information submitted to the Company by Client, and the Company shall not be obligated to conduct any independent investigation or inquiry with respect thereto.
3. The Company may, in its sole discretion, destroy samples which have been furnished to the Company for testing and which have not been destroyed in the course of testing. The Company may delegate the performance of all or a portion of the services contemplated hereunder to an affiliate, agent or subcontractor of the Company, and Client consents to such delegation.
4. These Conditions and the Test Report represent the entire understanding of the parties hereto with respect to the subject matter hereof and of the Test Report, and no modification, variance or extrapolation with respect thereto shall be permitted without the prior written consent of the Company.
5. The names, service marks, trademarks and copyrights of the Company and its affiliates, including the names "BUREAU VERITAS," "BUREAU VERITAS CONSUMER PRODUCTS SERVICES," "BVCPS," "MTL," "ACTS," "MTL-ACTS" and "CURTIS-STRAUS" (collectively, the "Marks") are and shall remain the sole property of the Company or its affiliates and shall not be used by Client except solely to the extent that Client obtains the prior written approval of the Company and then only in the manner prescribed by the Company. Client shall not contest the validity of the Marks or take any action that might impair the value or goodwill associated with the Marks or the image or reputation of the Company or its affiliates.
6. Payment in full shall be due 30 days after the date of invoice. Interest shall be due on overdue amounts from the due date until paid at an interest rate of 1.5% per month or, if less, the maximum rate permitted by law. The Company reserves the right, at any time and from time to time, to revoke any credit extended to Client. Client shall reimburse the Company for any costs it incurs in collecting past due amounts, including court costs and fees and expenses of attorneys and collection agencies. The Test Report may not be used or relied upon by Client if and for so long as Client fails to pay when due any invoice issued by the Company or any affiliate of it to Client or any affiliate or subsidiary of Client together with interest and penalties, if any, accrued thereon.
7. The Company disclaims any and all responsibility or liability arising out of or in connection with e-mail transmissions of such information.
8. Client understands and agrees that the Company is neither an insurer nor a guarantor, that the Company does not take the place of Client or any designer, manufacturer, agent, buyer, distributor or transportation or shipping company, and that the Company disclaims all liability in such capacities. Client further understands that if it seeks assurance against loss or damage, it should obtain appropriate insurance.
9. Client agrees that the Company, by providing the services, does not take the place of Client nor any third party, nor does the Company release them from any of their obligations, nor does the Company otherwise assume, abridge, abrogate or undertake to discharge any duty of any third party to Client or any duty of Client or any third party to any other third party, and Client will not release any third party from its obligations and duties with respect to the tested goods.
10. Client shall, on a timely basis, (a) provide adequate instructions to the Company in order to enable the Company to perform properly its services, (b) provide, or cause Client's suppliers and contractors to provide, the Company with all documents necessary to enable the Company to perform its services, (c) furnish the Company with all relevant information regarding Client's intended use and purposes of the tested goods, (d) advise the Company of essential dates and deadlines relevant to the tested goods and (e) fully exercise all rights and remedies available to Client against third parties in respect of the tested goods.
11. The Company shall undertake due care and ordinary skill in the performance of its services to Client, and the Company shall accept responsibility only where such skill has not been exercised and, even in such event, only to the extent of the limitation of liability set forth herein.
12. If Client desires to assert a claim arising from or relating to (i) the performance, purported performance or non-performance of any services by the Company or (ii) the sale, resale, manufacture, distribution or use of any tested goods, it must submit that claim to the Company in a writing that sets forth with particularity the basis for such claim within 60 days from discovery of the potential claim and not more than six months after the date of issuance of the Test Report to Client. Client waives any and all such claims including, without limitation, claims that the Test Report is inaccurate, incomplete or misleading or that additional or different testing is required, unless and then only to the extent that Client submits a written claim to the Company within both such time periods.

13. CLIENT SHALL, EXCEPT TO THE EXTENT OF COMPANY'S LIABILITY TO CLIENT HEREUNDER (WHICH IN NO EVENT SHALL EXCEED THE LIMITATION OF LIABILITY HEREIN), HOLD HARMLESS AND INDEMNIFY THE COMPANY, ITS AFFILIATES AND THEIR RESPECTIVE DIRECTORS, OFFICERS, EMPLOYEES, AGENTS AND SUBCONTRACTORS AGAINST ALL ACTUAL OR ALLEGED THIRD PARTY CLAIMS FOR LOSS, DAMAGE OR EXPENSE OF WHATSOEVER NATURE AND HOWSOEVER ARISING FROM OR RELATING TO (i) THE PERFORMANCE, PURPORTED PERFORMANCE OR NON-PERFORMANCE OF ANY SERVICES BY THE COMPANY OR (ii) THE SALE, RESALE, MANUFACTURE, DISTRIBUTION OR USE OF ANY TESTED GOODS.

14. EXCEPT AS MAY OTHERWISE BE EXPRESSLY AGREED TO IN WRITING BY THE COMPANY AND NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN OR IN ANY TEST REPORT, NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, IS MADE.

15. (A) IN NO EVENT WHATSOEVER SHALL THE COMPANY BE LIABLE FOR ANY CONSEQUENTIAL, SPECIAL, INCIDENTAL, EXEMPLARY OR PUNITIVE DAMAGES IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE TEST REPORT OR THE SERVICES PROVIDED BY THE COMPANY HEREUNDER, INCLUDING WITHOUT LIMITATION LOSS OF OR DAMAGE TO PROPERTY; LOSS OF INCOME, PROFIT OR USE; OR ANY CLAIMS OR DEMANDS MADE AGAINST CLIENT OR ANY OTHER PERSON BY ANY THIRD PARTY IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE SERVICES PROVIDED BY THE COMPANY HEREUNDER.

(B) NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN, AND IN RECOGNITION OF THE RELATIVE RISKS AND BENEFITS TO CLIENT AND THE COMPANY ASSOCIATED WITH THE TESTING SERVICES CONTEMPLATED HEREBY, THE RISKS HAVE BEEN ALLOCATED SUCH THAT UNDER NO CIRCUMSTANCES WHATSOEVER SHALL THE LIABILITY OF THE COMPANY TO CLIENT OR ANY THIRD PARTY IN RESPECT OF ANY CLAIM FOR LOSS, DAMAGE OR EXPENSE, OF WHATSOEVER NATURE OR MAGNITUDE, AND HOWSOEVER ARISING, EXCEED AN AMOUNT EQUAL TO FIVE (5) TIMES THE AMOUNT OF THE FEES PAID TO THE COMPANY FOR THE SPECIFIC SERVICES WHICH GAVE RISE TO SUCH CLAIM OR U.S.\$10,000, WHICHEVER IS THE LESSER AMOUNT.

16. The Company shall not be liable for any loss or damage resulting from any delay or failure in performance of its obligations hereunder resulting directly or indirectly from any event of force majeure or any event outside the control of the Company. If any such event occurs, the Company may immediately cancel or suspend its performance hereunder without incurring any liability whatsoever to Client.

17. Company's services, including these Conditions, shall be governed by, and construed in accordance with, the local laws of the country where the Company performs the tests or, in the case of tests performed in the United States of America, the laws of Massachusetts without regard to conflicts of laws principles. If any aspect(s) of these Conditions is found to be illegal or unenforceable, the validity, legality and enforceability of all remaining aspects of these Conditions shall not in any way be affected or impaired thereby. Any proceeding related to the subject matter hereof shall be brought, if at all, in the courts of the country where the Company performs the tests or, in the case of tests performed in the United States of America, in the courts of Massachusetts. Client waives the right to interpose any counterclaim or setoffs of any nature in any litigation arising hereunder.

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