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Test Report

Report No	EP1199-1
Client	LightLab Imaging Inc (St. Jude Medical) Escipion Baez
Address	4 Robbins Road Westford, MA 01886
Phone	978-577-3449
Item tested	OPTIS Mobile with ACR - PIU RFID (M/N: C408661 / C408650)
Standards FCC ID	FCC Part 15 Section 15.225 (spurious emissions only) SB6C408650
FRN	0022489843
Test Dates	May 15, 2015
Results	As detailed within this report
Prepared by	 Tuyen Truong – Compliance Engineer
Authorized by	 Christopher Reynolds – EMC Supervisor
Issue Date	<u>7/13/2015</u>
Conditions of Issue	This Test Report is issued subject to the conditions stated in the 'Conditions of Testing' section on page 9 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.



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Summary

This report details the partial testing of the OPTIS Mobile with ACR - PIU RFID controller with the following modifications:

- ACR – PIU RFID controller is tested with the OPTIS Mobile system product family line. Please note that no electrical hardware, antenna, enclosure or software was changed on the RFID controller itself.

The RFID was originally tested under EL1585-1 for FCCID: SB6C408650 for the system MN:C408650. This report is in an effort to add the system MN:C408661 to the product family via a Class II permissive change. Per the client, the RFID radio is electrically identical to the original unit. Please refer to the client's product family description exhibit for more information.

Radiated emissions testing were performed according to ANSI C63.4 (2009). Radiated Spurious Emissions (from 9 KHz to 1000MHz) was performed on the MN:C408661 system and tested according to FCC part 15.225(d) with emissions compared to the limit of FCC part 15.209.

The test sample was received in good condition.

Please note that the OPTIS Mobiles (M/N: C408661 and C408650) with ACR – PIU RFID controllers are listed as product family line per exhibits. Only the OPTIS Mobile (M/N: C408661) with ACR – PIU RFID controller was tested.

Issue No.	Reason for change	Date Issued
1	Original Release	July 13, 2015

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Product Tested - Configuration Documentation

EUT Configuration							
Work Order: P1199 Company: LightLab Imaging (St. Jude Medical) Company Address: 4 Robbins Road Westford MA USA 01886 Contact: Escipion Baez Person Present: Jesus Balza							
	MN	PN	SN	FCC ID			
EUT consists of the following:							
Mobile OPTIS System:	C408661	--	14739412	--			
V2 ACR mobile PC:	--	--	15265783	--			
M5 RoHS Engine:	--	100103959	51141416	--			
I/O Panel-BLUETOOTH V2.1 USB	--	--	--	CJ6UPA3710BT			
NANO ADAPTER:	--	--	--				
Tableside controller:	--	--	15344814	QOQWT12A			
PIU 2.2:	--	--	14666290				
EUT Description: ILUMIEN OPTIS System with V2 ACR mobile PC and M5 RoHS Engine							
EUT Max Frequency: 3400MHz							
EUT Min Frequency: 24MHz							
EUT TX Frequency: 13.56MHz							
Support Equipment:							
	MN	SN					
Laptop	HP ProBook 4310e	--					
FFR Wi Box	--	11103138					
FFR Aeris Pressure Wire Receiver	--	3954					
AC to DC brick	FRM06-S05-UU	--					
USB thumb drive	FG2990174	--					
EUT Ports:							
Port Label	Port Type	No. of ports	No. Populated	Cable Type	Shielded		
AC Mains	Power Input	1	1	3-wires	No		
Ethernet	RJ45	1	1	cat.5e	No		
Video In	DVI	1	1	DVI	Yes		
Video Out	DVI	1	1	DVI	Yes		
PIU	Fiber Optics/Power	1	1	Fiber Optics/Copper	Yes		
USB	USB	2	2	USB	Yes		
Tableside Controller (Bluetooth)	USB/Power	1	1	USB	Yes		
Software / Operating Mode Description:							
EUT is running RFI tag at 13.56MHz, continuous PIU, FFR test, laser viewer. Running Bluetooth, External monitor for third video OutPut, and ACR Video Input.							

Statement of Conformity

The OPTIS Mobile with ACR - PIU RFID controller has been found to conform to the following parts of 47 CFR as detailed below:

Part 15	Comments
15.205	The fundamental is not in a Restricted band and the spurious
15.209	and harmonic emissions in the Restricted bands comply with the general emission limits of FCC 15.209.

Note: EUT was partially tested; Permissive Change only.

Test Results

Radiated Spurious Emissions

LIMITS

"The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209" [15.225(d)]

MEASUREMENTS

Radiated Emissions Table

Date: 15-May-15	Company: LightLab Imaging	Work Order: P1199								
Engineer: Chris Bramley	EUT Desc: OPTIS Mobile with ACR - PIU RFID	EUT Operating Voltage/Frequency: 24Vdc								
Temp: 25.4°C	Humidity: 21%	Pressure: 1014mBar								
Frequency Range: 27.12MHz		Measurement Distance: 3 m								
Notes: Harmonics of RFID fundamental frequency at 13.56MHz		EUT Max Freq: 13.56MHz								
Antenna Polarization (0° - 90°)	Frequency (MHz)	Reading (dB _µ V)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dB _µ V/m)	FCC 15.209			
										Limit (dB _µ V/m)
0	27.12	4.4	25.1	37.4	0.3	17.0		50.0	-33.0	Pass
90	27.12	10.9	25.1	37.4	0.3	23.5		50.0	-26.5	Pass
Table Result: Pass		by	-26.5 dB		Worst Freq: 27.12 MHz					

Test Site: EMI Chamber 1	Cable 1: Asset #2051	Cable 2: Asset #2053
Analyzer: Asset #1327	Preamp: Red-White	Antenna: Sm Loop (high)

Rev.5/14/2015

Spectrum Analyzers / Receivers/Preselectors SA EMI Chamber (1327)	Range 9kHz-13.2 GHz	MN E4405B	Mfr Agilent	SN MY45103416	Asset 1327	Cat I	Calibration Due 1/20/2016	Calibrated on 1/20/2015
Radiated Emissions Sites EMI Chamber 1	FCC Code 719150	IC Code 2762A-6	VCCI Code A-0015	Range 30-1000MHz		Cat II	Calibration Due 3/21/2017	Calibrated on 3/21/2015
Preamps /Couplers Attenuators / Filters Red-White	Range 0.009-2000MHz	MN ZFL-1000-LN	Mfr CS	SN N/A	Asset 1258	Cat II	Calibration Due 12/26/2015	Calibrated on 12/26/2014
Antennas Small Loop	Range 10kHz-30MHz	MN PLA-130/A	Mfr ARA	SN 1024	Asset 755	Cat I	Calibration Due 5/29/2015	Calibrated on 5/29/2014
Cables Asset #2051 Asset #2053	Range 9kHz - 18GHz 9kHz - 18GHz		Mfr Florida RF Florida RF			Cat II II	Calibration Due 3/8/2016 3/8/2016	Calibrated on 3/8/2015 3/8/2015
Meteorological Meters Weather Clock (Pressure Only) TH A#2080		MN BA928 HTC-1	Mfr Oregon Scientific HDE	SN C3166-1	Asset 831 2080	Cat I II	Calibration Due 3/19/2016 4/2/2016	Calibrated on 3/19/2014 4/2/2015

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

Radiated Emissions Table

Date: 15-May-15	Company: LightLab Imaging	Work Order: P1199										
Engineer: Chris Bramley	EUT Desc: OPTIS Mobile with ACR - PIU RFID	EUT Operating Voltage/Frequency: 24Vdc										
Temp: 25.4°C	Humidity: 21%	Pressure: 1014mBar										
Frequency Range: 30-1000MHz		Measurement Distance: 3 m										
Notes: Harmonics of RFID fundamental frequency at 13.56MHz		EUT Tx Freq: 13.56MHz										
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dB μ V)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dB μ V/m)	FCC 15.209					
										Limit (dB μ V/m)	Margin (dB)	Result (Pass/Fail)
v	40.68	39.8	25.1	13.6	0.4	28.7				40.0	-11.3	Pass
v	54.24	43.2	25.2	7.5	0.5	26.0				40.0	-14.0	Pass
v	67.8	37.9	25.4	8.6	0.5	21.6				40.0	-18.4	Pass
v	81.36	43.4	25.4	8.0	0.5	26.5				40.0	-13.5	Pass
v	94.92	39.1	25.3	8.9	0.5	23.2				43.5	-20.3	Pass
v	108.48	39.6	25.3	12.4	0.5	27.2				43.5	-16.3	Pass
v	122.04	40.3	25.4	14.3	0.6	29.8				43.5	-13.7	Pass
v	135.6	38.6	25.6	13.8	0.6	27.4				43.5	-16.1	Pass

Table Result: Pass by -11.3 dB**Worst Freq:** 40.68 MHz

Test Site: EMI Chamber 1

Cable 1: Asset #2051

Cable 2: Asset #2053

Analyzer: Asset #1327

Preamp: Red-White

Antenna: Red-Black

Rev.5/14/2015

Spectrum Analyzers / Receivers/Preselectors SA EMI Chamber (1327)	Range 9kHz-13.2 GHz	MN E4405B	Mfr Agilent	SN MY45103416	Asset 1327	Cat I	Calibration Due 1/20/2016	Calibrated on 1/20/2015
Radiated Emissions Sites EMI Chamber 1	FCC Code 719150	IC Code 2762A-6	VCCI Code A-0015	Range 30-1000MHz		Cat II	Calibration Due 3/21/2017	Calibrated on 3/21/2015
Preamps /Couplers Attenuators / Filters Red-White	Range 0.009-2000MHz	MN ZFL-1000-LN	Mfr CS	SN N/A	Asset 1258	Cat II	Calibration Due 12/26/2015	Calibrated on 12/26/2014
Antennas Red-Black BiLog	Range 30-2000MHz	MN JB1	Mfr Sunol	SN A091604-2	Asset 1106	Cat I	Calibration Due 2/9/2017	Calibrated on 2/9/2015
Cables Asset #2051 Asset #2053	Range 9kHz - 18GHz 9kHz - 18GHz		Mfr Florida RF Florida RF			Cat II	Calibration Due 3/8/2016 3/8/2016	Calibrated on 3/8/2015 3/8/2015
Meteorological Meters Weather Clock (Pressure Only) TH A#2080	MN BA928 HTC-1	Mfr Oregon Scientific HDE	SN C3166-1	Asset 831 2080	Cat I II	Calibration Due 3/19/2016 4/2/2016	Calibrated on 3/19/2014 4/2/2015	

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



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
Radiated Emissions (30-1000MHz) NIST CISPR	5.6dB 4.6dB	N/A 5.2dB (Ucispqr)
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 NIST CISPR	3.9dB 3.6dB	N/A 3.6dB (Ucispqr)
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 (@ 2.4GHz)	3.23×10^{-8}	1×10^{-7}
RF power, conducted	0.40dB	0.75dB
Maximum frequency deviation:		
• Within 300Hz and 6kHz of audio frequency / Within 6kHz and 25kHz of audio frequency	3.4% 0.3dB	5% 3dB
Adjacent channel power	1.9dB	3dB
Conducted spurious emission of transmitter, valid up to 12.75GHz	2.39dB	3dB
Conducted emission of receivers	1.3dB	3dB
Radiated emission of transmitter, valid up to 26.5GHz	3.9dB	6dB
Radiated emission of transmitter, valid up to 80GHz	3.3dB	6dB
Radiated emission of receiver, valid up to 26.5GHz	3.9dB	6dB
Radiated emission of receiver, valid up to 80GHz	3.3dB	6dB
Humidity	2.37%	5%
Temperature	0.7°C	1.0°C
Time	4.1%	10%
RF Power Density, Conducted	0.4dB	3dB
DC and low frequency voltages	1.3%	3%
Voltage (AC, <10kHz)	1.3%	2%
Voltage (DC)	0.62%	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 were 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 INrecognition 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.

The complete list of the Approved Subcontractors Curtis-Straus may use to delegate the performance of work can be provided upon request. Rev.160009121(2)_#684340 v14CS