TEST RESULT SUMMARY

FCC Part 15 Subpart C Section 15.231
FCC Part 15 Subpart C Section 15.207
RSS-210 Issue 9: August 2016
RSS-Gen Issue 4: November 2014

MANUFACTURER'S NAME	Cinch Systems Inc 12075 43rd Street NE Suite 300 St Michael MN 55376 USA
PRODUCT NAME	Hardwire wireless converter home security sensor 8 and 16 channels (16 channel version tested as worst case)
MODEL NUMBER(S) TESTED	RF-CHW-ITI-16-S, QS7130
SERIAL NUMBER(S) TESTED	5555
PRODUCT DESCRIPTION	Hardwire wireless converter home security sensor 8 and 16 channels (16 channel version tested as worst case) with 319.5 MHz intentional radiator
TEST REPORT NUMBER	NC72121382.1
TEST DATE(S)	28 October – 01 November 2016

TÜV SÜD America Inc, as an independent testing laboratory, declares that the equipment tested as specified above conforms to the applicable EMC requirements of FCC Part 15 Subpart C Sections 15.207 “Conducted Limits” and FCC Part 15 Subpart C Section 15.231 “Periodic operation in the band 40.66–40.70 MHz and above 70 MHz.” and Spectrum Management and Telecommunications Radio Standard Specification RSS-210 Issue 9 “Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment” and Spectrum Management and Telecommunications Radio Standard Specification RSS-Gen Issue 4 “General Requirements and Information for the Certification of Radio Apparatus”.

It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics. Any modifications necessary for compliance made during testing on the above mentioned date(s) must be implemented in all production units for compliance to be maintained.

Issue Date: 04 November 2016

Joel T Schneider
Senior EMC Engineer

Greg Jakubowski
Senior EMC Technician

Not Transferable

EMC TEST REPORT

Test Report No.	**NC72121382.1** Date of issue: 04 November 2016
Product Names	Hardwire wireless converter home security sensor 8 and 16 channels (16 channel version tested as worst case)
Model(s) Tested	RF-CHW-ITI-16-S, QS7130
Serial No(s) Tested	5555
Product Description	Hardwire wireless converter home security sensor 8 and 16 channels (16 channel version tested as worst case) with 319.5 MHz intentional radiator
Manufacturer	Cinch Systems Inc 12075 43rd Street NE Suite 300 St Michael MN 55376
Issuing Laboratory	TÜV SÜD America Inc USA 1775 Old Highway 8 NW, Suite 104 New Brighton MN 55112 - 1891 Phone: 651-631-2487 / Fax: 651-638-0285
Test Result	■ **Positive** ☐ **Negative**

TÜV SÜD America Inc reports apply only to the specific samples tested under stated test conditions. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. TÜV SÜD America Inc shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV SÜD America Inc issued reports.

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TÜV SÜD America Inc and its professional staff hold government and professional organization certifications and are members of AAMI, ACIL, AEA, ANSI, IEEE, NARTE, and VCCI.

America

REVISION RECORD

REVISION	TOTAL NUMBER OF PAGES	DATE	DESCRIPTION
	28	03 November 2016	Initial Release

DIRECTORY

Contents

LAB ACCREDITATION:
TÜV SÜD America's New Brighton and Taylors Falls Labs maintain A2LA accreditation to ISO/IEC 17025 for the specific tests listed in A2LA Certificate #2955.11 as Electrical Testing Laboratories, and are recognized by the National RRA under Phase I of the APEC Tel MRA, Identification Number US0080. These Labs are located at the following addresses:

Main Location:	1775 Old Highway 8 NW, Suite 104 New Brighton MN 55112-1891 USA
Satellite Location:	19333 Wild Mountain Road Taylors Falls MN 55084 USA

EMC TEST REGULATIONS:
The tests were performed according to the following regulations:
FCC Part 15 Subpart C §15.231
RSS-210 Issue 9: August 2016
RSS-Gen Issue 4: November 2014

ENVIRONMENTAL CONDITIONS IN THE LAB

	Actual
Temperature:	: 16-21°C
Atmospheric pressure	: 98-99kPa
Relative Humidity	: 49-51%

POWER SUPPLY UTILIZED
Power supply system : 110 V / 60 Hz

TEST EQUIPMENT
All measurement instrumentation is traceable to the National Institute of Standards and Technology and is calibrated according to internal procedure.

MEASUREMENT UNCERTAINTY
The test system for conducted emissions is defined as the LISN, tuned receiver or spectrum analyzer, and coaxial cable. The test system has a measurement uncertainty of ±1.8 dB. The test system for radiated emissions is defined as the antenna, the pre-amplifier, the spectrum analyzer and the coaxial cable. The test system has a measurement uncertainty of ±4.8 dB. All measurement instrumentation is traceable to the National Institute of Standards and Technology and is calibrated according to internal procedure.

SIGN EXPLANATIONS
☐ - not applicable
■ - applicable

Radiated Emissions 30 - 3200 MHz
FCC 15.231(b), RSS-210 A1.2

Test summary
The requirements are: ■ - MET ☐ - NOT MET
Testing was performed in accordance with the test procedure of ANSI C63.10 2013, clause 6.3.

Test location
Taylors Falls Lab Large Test Site (Open Area Test Site)

Test distance
3 meters

Test Equipment

TUV ID	Model	Manufacturer	Description	Serial	Cal Date	Cal Due
WRLE10863	N/A	TÜV SÜD America Inc	Test Companion Software Version 3.4.76	N/A	Code Y	Code Y
WRLE03203	EM-6917B	Electro-Metrics	Biconicalog Periodic	106	09-Dec-15	09-Dec-16
WRLE10896	ZHL-1042J	Mini-Circuits	Amplifier Broadband AMP/ SMA QA1148002	NA	Code B 27-Jan-16	Code B 27-Jan-17
WRLE03894	NHP-600	Mini-Circuits	30-600 MHz Stopband Filter	2	Code B 02-Jun-16	Code B 02-Jun-17
WRLE10527	SL18B4020	Phase One Microwave	Preamplifier 1 – 18 GHz	0001	Code B 04-Jan-16	Code B 04-Jan-17
OWLE02074	3115	Electro-Mechanics (EMCO)	Ridge Guide Antenna	2504	21-Mar-16	21-Mar-17
NBLE11000	E4440A	Agilent	Spectrum Analyzer	MY44303856	27 Jan 16	27 Jan 17

Code B = Calibration verification performed internally. Code Y = Calibration not required when used with other calibrated equipment

Limit with 319.5 MHz fundamental and 3 meter distance

Detector	Field strength fundamental (μV/m)	Field strength Spurious (μV/m)
Average	6229	622.9
Peak	62291	6229

The emission limits shown in the above table are based on measurements employing a CISPR average detector. When average radiated emission measurements are specified in this part, including average emission measurements below 1000 MHz, there also is a limit on the peak level of the radio frequency emissions. Unless otherwise specified, *e.g.*, see §§ 15.250, 15.252, 15.255, and 15.509–15.519, the limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test. Further, compliance with the provisions of §15.205 shall be demonstrated using the measurement instrumentation specified in that section. Radiated emissions from the EUT are measured in the frequency range of 30 to 1000 MHz using a spectrum analyzer or receiver and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with a 120 kHz / 6 dB bandwidth and average/peak/quasi-peak detection and measurements above 1000 MHz are made with a 1 MHz RBW/VBW / 6 dB bandwidth and peak detection, 1 MHz RBW/ 10 Hz VBW for average detection. Table top equipment is placed on a non-conductive support 80 cm above the ground plane. Interface cables that are closer than 40 centimeters to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimeters from the ground plane. The antenna is positioned 3 meters horizontally from the EUT. To locate maximum emissions from the test sample is rotated through 3 orthogonal axes, the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarizations and the EUT is rotated 360 degrees. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB / decade (inverse linear-distance for field strength measurements).

Test data

Measurement summary for limit1: fcc 15.231-319.5 MHz fundamental (Pk)							
FREQ (MHz)	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV/m)	FINAL (uV/m)	LIMIT (uV/m)	POL / HGT / AZ (m)(DEG)	
319.508	73.4 Pk	1.91 / 19.7 / 0.0 / 0.0	95.01	56298	62295	H / 1.00 / 137	

Measurement summary for limit1: fcc 15.231-319.5 MHz fundamental (Av)							
FREQ (MHz)	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV/m)	FINAL (uV/m)	LIMIT (uV/m)	POL / HGT / AZ (m)(DEG)	
319.508	44.2 Av	1.91 / 19.7 / 0.0 / 0.0	65.81	1952	6229.5	H / 1.00 / 137	

Scan through 3 orthogonal axis for highest fundamental emission level
Device on its back (Tx antenna horizontal)
Tx antenna length = 58mm outside the case
Fundamental measured with a receiver (120kHz RBW)
Device is transmitting packets continuously and configured (for test purposes) to provide its
maximum possible total on time:

Measurement summary for limit1: fcc 15.231-319.5 MHz spurious (Pk)							
FREQ (MHz)	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV/m)	FINAL (uV/m)	LIMIT (uV/m)	POL / HGT / AZ (m)(DEG)	
639.016	72.3 Pk	2.76 / 25.38 / 29.05 / 0.87	72.26	4102	6229.5	H / 1.19 / 153	
2556	59.93 Pk	21.03 / 28.7 / 43.65 / 0.3	66.32	2070	6229.5	H / 1.00 / 94	
1278	67.81 Pk	12.8 / 25.52 / 41.4 / 0.55	65.28	1836	6229.5	H / 1.00 / 270	
958.524	61.9 Pk	3.48 / 28.62 / 29.4 / 0.17	64.77	1731	6229.5	H / 1.00 / 207	
1598	62.33 Pk	15.32 / 25.99 / 42.53 / 0.4	61.51	1189	5000	H / 1.00 / 270	
3195	43.14 Pk	25.78 / 30.59 / 43.6 / 0.2	56.11	638.9	6229.5	V / 1.00 / 0	
2876	47.27 Pk	22.93 / 29.26 / 43.67 / 0.25	56.04	633.8	5000	V / 1.00 / 0	
1917	53.83 Pk	16.87 / 28.07 / 43.38 / 0.34	55.73	611.6	6229.5	H / 1.00 / 270	
2237	52.44 Pk	18.64 / 27.81 / 43.57 / 0.36	55.68	608.1	5000	H / 1.00 / 270	

Measurement summary for limit1: fcc 15.231-319.5 MHz spurious (Av)							
FREQ (MHz)	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV/m)	FINAL (uV/m)	LIMIT (uV/m)	POL / HGT / AZ (m)(DEG)	
2556	43.13 Av	21.03 / 28.7 / 43.65 / 0.3	49.51	298.6	622.95	H / 1.00 / 94	
3195	35.98 Av	25.78 / 30.59 / 43.6 / 0.2	48.95	280.2	622.95	V / 1.00 / 0	
1278	50.85 Av	12.8 / 25.52 / 41.4 / 0.55	48.32	260.6	622.95	H / 1.00 / 270	
2876	38.48 Av	22.93 / 29.26 / 43.67 / 0.25	47.25	230.4	500	V / 1.00 / 0	
639.016	45.2 Av	2.76 / 25.38 / 29.05 / 0.87	45.16	181.1	622.95	H / 1.19 / 153	
2237	40.28 Av	18.64 / 27.81 / 43.57 / 0.36	43.52	149.9	500	V / 1.00 / 0	
1917	39.8 Av	16.87 / 28.07 / 43.38 / 0.34	41.7	121.6	622.95	H / 1.00 / 270	
1598	42.49 Av	15.32 / 25.99 / 42.53 / 0.4	41.67	121.1	500	H / 1.00 / 270	
958.524	32.0 Av	3.48 / 28.62 / 29.4 / 0.17	34.87	55.39	622.95	H / 1.00 / 207	

Measurement summary for limit1: fcc 15.231-319.5 MHz spurious (QP)							
FREQ (MHz)	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV/m)	FINAL (uV/m)	LIMIT (uV/m)	POL / HGT / AZ (m)(DEG)	
399.385	58.8 Qp	2.18 / 21.7 / 29.12 / 0.0	53.56	476.4	622.95	V / 1.00 / 180	
78.69	60.07 Qp	0.9 / 12.98 / 29.04 / 0.0	44.91	175.9	622.95	V / 1.00 / 0	
39.41	51.03 Qp	0.58 / 21.9 / 28.89 / 0.0	44.62	170.2	622.95	V / 1.00 / 20	

Measurement summary for limit1: fcc 15.231-319.5 MHz spurious (QP)

FREQ (MHz)	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV/m)	FINAL (uV/m)	LIMIT (uV/m)	POL / HGT / AZ (m)(DEG)	
79.77	56.45 Qp	0.91 / 12.94 / 29.04 / 0.0	41.26	115.6	622.95	V / 1.00 / 0	
82.59	56.05 Qp	0.94 / 12.85 / 28.92 / 0.0	40.92	111.1	622.95	V / 1.00 / 90	
76.23	54.6 Qp	0.88 / 13.25 / 29.28 / 0.0	39.46	93.97	622.95	V / 1.00 / 90	
37.19	45.05 Qp	0.56 / 22.6 / 28.89 / 0.0	39.32	92.46	622.95	V / 1.00 / 90	
87.87	52.4 Qp	0.98 / 13.35 / 28.98 / 0.0	37.75	77.17	622.95	V / 1.00 / 90	
35.45	41.58 Qp	0.54 / 23.22 / 28.86 / 0.0	36.48	66.68	622.95	V / 1.00 / 220	
100.596	47.7 Qp	1.09 / 14.87 / 29.08 / 0.0	34.58	53.57	622.95	V / 1.00 / 0	
73.77	48.55 Qp	0.86 / 13.6 / 28.99 / 0.0	34.03	50.29	100	V / 1.00 / 90	Restricted band

Occupied bandwidth
FCC 15.231(c), RSS-210 A1.3

Test summary
The requirements are: ■ - MET ☐ - NOT MET
Testing was performed in accordance with the test procedure of ANSI C63.10-2013 clause 6.9.2

Test location
Taylors Falls Lab Large Test Site (Open Area Test Site)

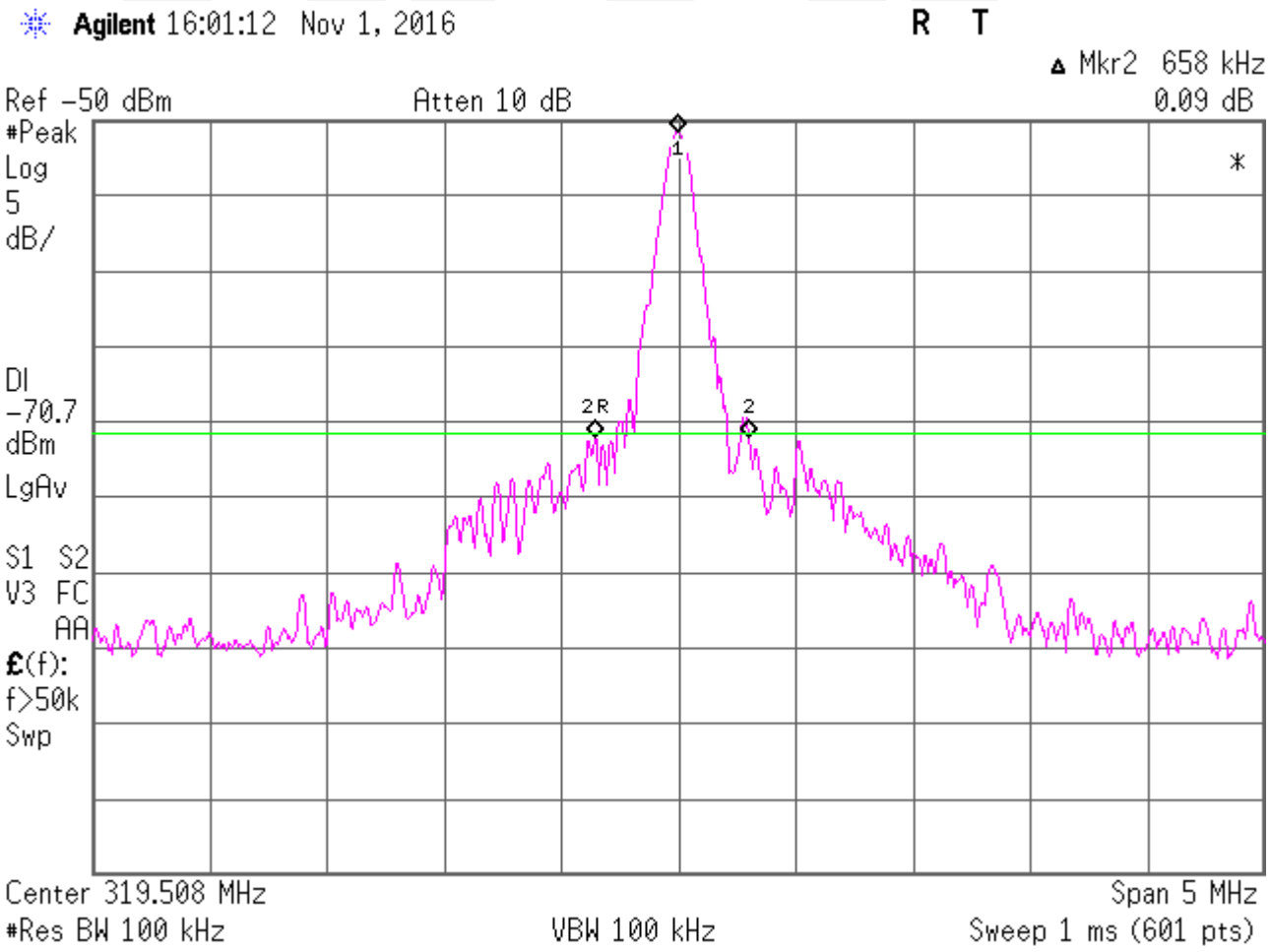
Test equipment

TUV ID	Model	Manufacturer	Description	Serial	Cal Date	Cal Due
WRLE01564	7405-901	EMCO	Near field probe	na	Code Y	Code Y
NBLE11000	E4440A	Agilent	Spectrum Analyzer	MY44303856	27 Jan 16	27 Jan 17

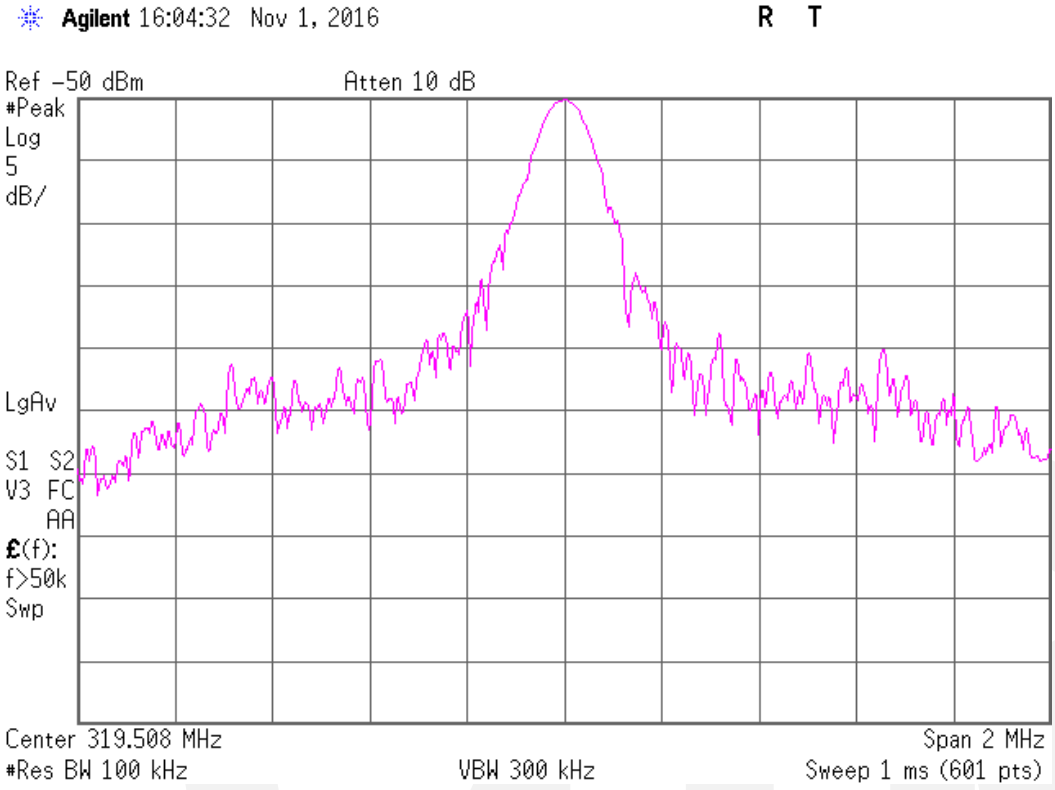
Code Y = Calibration not required when used with other calibrated equipment.

Test limit
No wider than 0.25% of the center frequency. 319.508 MHz x 0.25% = 798.77 kHz. Per FCC, measured at the -20 dBc points. Per IC RSS-210 A1.1.3, the 99% bandwidth.

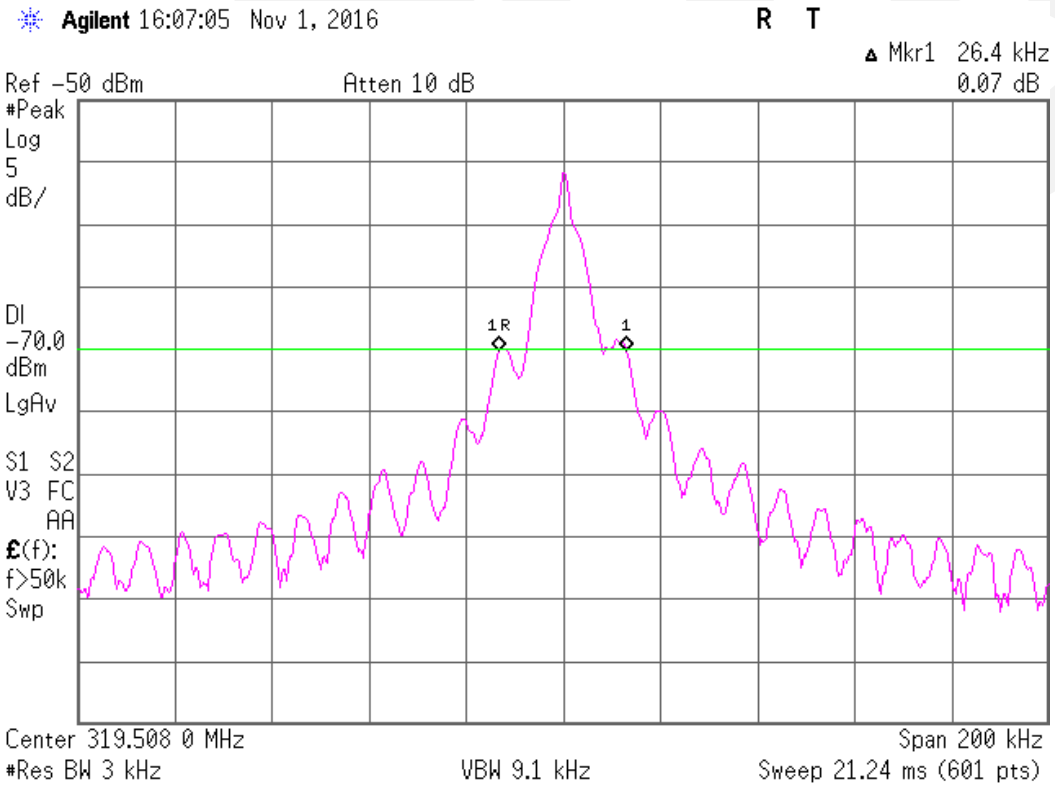
Test data per FCC 15.231(c)
20 dB occupied bandwidth = 658 kHz. Less than 798.77 kHz. PASS
99% bandwidth = 26.4 kHz.



Test data per IC RSS-210



99% Bandwidth 1 of 2. RBW greater than OBW. Set ref lvl
2 of 2. RBW near 1% of OBW. Markers at -20dB from ref levl



Periodic operation
FCC 15.231(a), RSS-210 A1.1

Test summary
The requirements are: ■ - MET ☐ - NOT MET

Manufacturer declared operation mode.

Test Limit 15.231(a);
(2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.

"Whenever the transmitter is activated automatically it will transmit 8 packets of 23.6 msec in length spaced by 130 msec. Transmission cease after 1.1 seconds."

(3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.

"The supervisory periodic transmissions are the four automatic transmissions noted above. They occur once per hour, for a total hourly transmission time of 94.4 msec."

(4) Intentional radiators which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition

"The transmitter is limited to reporting devices opening and closing. Other than the initial status change condition report there are no repeat transmissions other than the hourly supervisory transmissions."

(5) Transmission of set-up information for security systems may exceed the transmission duration limits in paragraphs (a)(1) and (a)(2) of this section, provided such transmissions are under the control of a professional installer and do not exceed ten seconds after a manually operated switch is released or a transmitter is activated automatically. Such set-up information may include data.

"Set up information cannot exceed 16 23.6 msec packets, spaced by 130 msec. Transmissions cease after 2.2 seconds."

Conducted Emissions - AC Power Lines
FCC 15.207(a), IC RSS-Gen 7.2.4

Test summary
The requirements are: ■ - MET ☐ - NOT MET
Testing was performed in accordance with the test procedure of ANSI C63.4 2009, clause 7.2

Test location
■ - Wild River Lab Small Test Site (Open Area Test Site)

Test equipment used:

TUV ID	Model	Manufacturer	Description	Serial	Cal Date	Cal Due
WRLE10863	N/A	TÜV SÜD America Inc	Test Companion Software Version 3.4.71	N/A	Code Y	Code Y
WRLE10943	FCC-LISN-50-25-2-10	Fischer Custom Comm	LISN	120307	08 Aug 16	08 Aug 17
WRLE03800	ESCS 30	Rohde & Schwarz	EMI Receiver 9kHz-6.5GHz	100312	28-Jan-16	28-Jan-17

Cal Code B = Calibration verification performed internally. Cal Code Y = Calibration not required when used with other calibrated equipment.

Test limits, dBμV

Frequncy (MHz)	Quasi Peak	Average
0.15 - 0.5	66 - 56*	56 - 46*
0.5 - 5	56	46
5 - 30	60	50

*Decreases with the logarithm of the frequency

Conducted emissions on the 50 Hz and/or 60 Hz power interface of the EUT are measured in the frequency range of 150 kHz to 30 MHz. The measurements are performed using a receiver, which has CISPR characteristic bandwidth (9 kHz resolution bandwidth) and quasi-peak/average detection, and a Line Impedance Stabilization Network (LISN), with 50 Ω/50 μH (CISPR 16) characteristics. Table top equipment is placed on a non-conducting table 80 centimeters above the floor and is positioned 40 centimeters from the vertical ground plane (wall) of the screen room. In some cases, a pre-scan using a spectrum analyzer is initially performed on the units comprising the system under test to locate the highest emissions.

Test data
See following pages.

CONDUCTED EMISSIONS

Test Report #:	NC72121382 Run 5	Test Area:	STS		
EUT Model #:	RF-CHW-ITI-16-S	Date:	11/1/2016		
EUT Serial #:	5555	EUT Power:	110V / 60Hz	Temperature:	16.0 °C
Test Method:	FCC 15.207			Air Pressure:	99.0 kPa
Customer:	Cinch Systems Inc.			Rel. Humidity:	51.0 %
EUT Description:	Hardwire wireless converter home security sensor. 16 channel				
Notes:					
Data File Name:	21382.dat			Page:	1 of 5

List of measurements for run #: 5

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV)	EUT Lead	DELTA1 FCC 15.207 Qp	DELTA2 FCC 15.207 Avg
173.438 kHz	42.86 Qp	0.13 / -0.25 / 0.0 / 0.0	42.74	L1	-22.05	n/a
239.844 kHz	38.75 Qp	0.17 / -0.24 / 0.0 / 0.0	38.68	L1	-23.42	n/a
489.844 kHz	34.3 Qp	0.25 / -0.2 / 0.0 / 0.0	34.35	L1	-21.82	n/a
720.313 kHz	39.26 Qp	0.32 / -0.17 / 0.0 / 0.0	39.4	L1	-16.6	n/a
985.938 kHz	31.58 Qp	0.38 / -0.14 / 0.0 / 0.0	31.82	L1	-24.18	n/a
1.607 MHz	28.73 Qp	0.54 / -0.05 / 0.0 / 0.0	29.21	L1	-26.79	n/a
2.935 MHz	26.22 Qp	0.8 / -0.01 / 0.0 / 0.0	27.01	L1	-28.99	n/a
4.525 MHz	31.02 Qp	1.1 / -0.03 / 0.0 / 0.0	32.1	L1	-23.9	n/a
6.545 MHz	23.5 Qp	1.34 / -0.05 / 0.0 / 0.0	24.8	L1	-35.2	n/a
10.998 MHz	25.27 Qp	1.82 / -0.09 / 0.0 / 0.0	27.0	L1	-33.0	n/a
16.341 MHz	30.27 Qp	2.23 / -0.14 / 0.0 / 0.0	32.35	L1	-27.65	n/a
21.111 MHz	43.35 Qp	2.54 / -0.19 / 0.0 / 0.0	45.7	L1	-14.3	n/a
24.595 MHz	32.36 Qp	2.76 / -0.18 / 0.0 / 0.0	34.94	L1	-25.06	n/a
29.697 MHz	16.3 Qp	3.0 / -0.15 / 0.0 / 0.0	19.15	L1	-40.85	n/a
173.438 kHz	36.12 Av	0.13 / -0.25 / 0.0 / 0.0	36.0	L1	n/a	-18.79
239.844 kHz	32.99 Av	0.17 / -0.24 / 0.0 / 0.0	32.92	L1	n/a	-19.18
489.844 kHz	28.66 Av	0.25 / -0.2 / 0.0 / 0.0	28.71	L1	n/a	-17.46
720.313 kHz	32.13 Av	0.32 / -0.17 / 0.0 / 0.0	32.27	L1	n/a	-13.73
985.938 kHz	23.35 Av	0.38 / -0.14 / 0.0 / 0.0	23.59	L1	n/a	-22.41
1.607 MHz	19.58 Av	0.54 / -0.05 / 0.0 / 0.0	20.06	L1	n/a	-25.94
2.935 MHz	16.55 Av	0.8 / -0.01 / 0.0 / 0.0	17.34	L1	n/a	-28.66
4.525 MHz	21.42 Av	1.1 / -0.03 / 0.0 / 0.0	22.5	L1	n/a	-23.5
6.545 MHz	16.2 Av	1.34 / -0.05 / 0.0 / 0.0	17.5	L1	n/a	-32.5
10.998 MHz	19.25 Av	1.82 / -0.09 / 0.0 / 0.0	20.98	L1	n/a	-29.02
16.341 MHz	23.94 Av	2.23 / -0.14 / 0.0 / 0.0	26.02	L1	n/a	-23.98
21.111 MHz	35.91 Av	2.54 / -0.19 / 0.0 / 0.0	38.26	L1	n/a	-11.74
24.595 MHz	25.5 Av	2.76 / -0.18 / 0.0 / 0.0	28.08	L1	n/a	-21.92
29.697 MHz	12.35 Av	3.0 / -0.15 / 0.0 / 0.0	15.2	L1	n/a	-34.8

Tested by: Greg Jakubowski (Printed) — G Jakubowski (Signature)

Reviewed by: Joel T Schneider (Printed) — Joel T. Schneider (Signature)

CONDUCTED EMISSIONS

Test Report #:	NC72121382 Run 5	Test Area:	STS		
EUT Model #:	RF-CHW-ITI-16-S	Date:	11/1/2016		
EUT Serial #:	5555	EUT Power:	110V / 60Hz	Temperature:	16.0 °C
Test Method:	FCC 15.207			Air Pressure:	99.0 kPa
Customer:	Cinch Systems Inc.			Rel. Humidity:	51.0 %
EUT Description:	Hardwire wireless converter home security sensor. 16 channel				
Notes:					
Data File Name:	21382.dat			Page:	2 of 5

List of measurements for run #: 5

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV)	EUT Lead	DELTA1 FCC 15.207 Qp	DELTA2 FCC 15.207 Avg
153.906 kHz	41.14 Qp	0.12 / -0.25 / 0.0 / 0.0	41.01	N	-24.78	n/a
177.344 kHz	39.66 Qp	0.13 / -0.25 / 0.0 / 0.0	39.55	N	-25.06	n/a
263.281 kHz	32.75 Qp	0.18 / -0.23 / 0.0 / 0.0	32.69	N	-28.63	n/a
450.781 kHz	32.4 Qp	0.24 / -0.21 / 0.0 / 0.0	32.43	N	-24.43	n/a
735.938 kHz	38.91 Qp	0.32 / -0.17 / 0.0 / 0.0	39.06	N	-16.94	n/a
1.029 MHz	30.47 Qp	0.39 / -0.13 / 0.0 / 0.0	30.73	N	-25.27	n/a
1.732 MHz	29.46 Qp	0.57 / -0.04 / 0.0 / 0.0	29.99	N	-26.01	n/a
2.384 MHz	30.62 Qp	0.7 / 0.0 / 0.0 / 0.0	31.31	N	-24.69	n/a
3.677 MHz	30.68 Qp	0.96 / -0.02 / 0.0 / 0.0	31.62	N	-24.38	n/a
4.533 MHz	31.15 Qp	1.1 / -0.03 / 0.0 / 0.0	32.23	N	-23.77	n/a
5.088 MHz	32.35 Qp	1.18 / -0.03 / 0.0 / 0.0	33.5	N	-26.5	n/a
16.088 MHz	30.57 Qp	2.21 / -0.14 / 0.0 / 0.0	32.64	N	-27.36	n/a
21.236 MHz	43.13 Qp	2.55 / -0.19 / 0.0 / 0.0	45.49	N	-14.51	n/a
23.084 MHz	34.22 Qp	2.66 / -0.19 / 0.0 / 0.0	36.69	N	-23.31	n/a
153.906 kHz	25.38 Av	0.12 / -0.25 / 0.0 / 0.0	25.25	N	n/a	-30.54
177.344 kHz	27.98 Av	0.13 / -0.25 / 0.0 / 0.0	27.87	N	n/a	-26.74
263.281 kHz	26.83 Av	0.18 / -0.23 / 0.0 / 0.0	26.77	N	n/a	-24.55
450.781 kHz	24.68 Av	0.24 / -0.21 / 0.0 / 0.0	24.71	N	n/a	-22.15
735.938 kHz	30.25 Av	0.32 / -0.17 / 0.0 / 0.0	30.4	N	n/a	-15.6
1.029 MHz	23.11 Av	0.39 / -0.13 / 0.0 / 0.0	23.37	N	n/a	-22.63
1.732 MHz	21.27 Av	0.57 / -0.04 / 0.0 / 0.0	21.8	N	n/a	-24.2
2.384 MHz	22.36 Av	0.7 / 0.0 / 0.0 / 0.0	23.05	N	n/a	-22.95
3.677 MHz	22.53 Av	0.96 / -0.02 / 0.0 / 0.0	23.47	N	n/a	-22.53
4.533 MHz	22.64 Av	1.1 / -0.03 / 0.0 / 0.0	23.72	N	n/a	-22.28
5.088 MHz	24.59 Av	1.18 / -0.03 / 0.0 / 0.0	25.74	N	n/a	-24.26
16.088 MHz	22.48 Av	2.21 / -0.14 / 0.0 / 0.0	24.55	N	n/a	-25.45
21.236 MHz	33.06 Av	2.55 / -0.19 / 0.0 / 0.0	35.42	N	n/a	-14.58
23.084 MHz	29.06 Av	2.66 / -0.19 / 0.0 / 0.0	31.53	N	n/a	-18.47

Tested by: Greg Jakubowski (Printed) — G Jakubowski (Signature)

Reviewed by: Joel T Schneider (Printed) — Joel T. Schneider (Signature)

CONDUCTED EMISSIONS

Test Report #:	NC72121382 Run 5	Test Area:	STS		
EUT Model #:	RF-CHW-ITI-16-S	Date:	11/1/2016		
EUT Serial #:	5555	EUT Power:	110V / 60Hz	Temperature:	16.0 °C
Test Method:	FCC 15.207			Air Pressure:	99.0 kPa
Customer:	Cinch Systems Inc.			Rel. Humidity:	51.0 %
EUT Description:	Hardwire wireless converter home security sensor. 16 channel				
Notes:					
Data File Name:	21382.dat			Page:	3 of 5

Measurement summary for limit1: FCC 15.207 Qp (Qp)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV)	EUT Lead	DELTA1 FCC 15.207Qp
21.111 MHz	43.35 Qp	2.54 / -0.19 / 0.0 / 0.0	45.7	L1	-14.3
21.236 MHz	43.13 Qp	2.55 / -0.19 / 0.0 / 0.0	45.49	N	-14.51
720.313 kHz	39.26 Qp	0.32 / -0.17 / 0.0 / 0.0	39.4	L1	-16.6
735.938 kHz	38.91 Qp	0.32 / -0.17 / 0.0 / 0.0	39.06	N	-16.94
489.844 kHz	34.3 Qp	0.25 / -0.2 / 0.0 / 0.0	34.35	L1	-21.82
173.438 kHz	42.86 Qp	0.13 / -0.25 / 0.0 / 0.0	42.74	L1	-22.05
23.084 MHz	34.22 Qp	2.66 / -0.19 / 0.0 / 0.0	36.69	N	-23.31
239.844 kHz	38.75 Qp	0.17 / -0.24 / 0.0 / 0.0	38.68	L1	-23.42
4.533 MHz	31.15 Qp	1.1 / -0.03 / 0.0 / 0.0	32.23	N	-23.77
985.938 kHz	31.58 Qp	0.38 / -0.14 / 0.0 / 0.0	31.82	L1	-24.18
3.677 MHz	30.68 Qp	0.96 / -0.02 / 0.0 / 0.0	31.62	N	-24.38
450.781 kHz	32.4 Qp	0.24 / -0.21 / 0.0 / 0.0	32.43	N	-24.43
2.384 MHz	30.62 Qp	0.7 / 0.0 / 0.0 / 0.0	31.31	N	-24.69
153.906 kHz	41.14 Qp	0.12 / -0.25 / 0.0 / 0.0	41.01	N	-24.78
24.595 MHz	32.36 Qp	2.76 / -0.18 / 0.0 / 0.0	34.94	L1	-25.06
1.029 MHz	30.47 Qp	0.39 / -0.13 / 0.0 / 0.0	30.73	N	-25.27
1.732 MHz	29.46 Qp	0.57 / -0.04 / 0.0 / 0.0	29.99	N	-26.01
5.088 MHz	32.35 Qp	1.18 / -0.03 / 0.0 / 0.0	33.5	N	-26.5
1.607 MHz	28.73 Qp	0.54 / -0.05 / 0.0 / 0.0	29.21	L1	-26.79
16.088 MHz	30.57 Qp	2.21 / -0.14 / 0.0 / 0.0	32.64	N	-27.36
16.341 MHz	30.27 Qp	2.23 / -0.14 / 0.0 / 0.0	32.35	L1	-27.65
263.281 kHz	32.75 Qp	0.18 / -0.23 / 0.0 / 0.0	32.69	N	-28.63
2.935 MHz	26.22 Qp	0.8 / -0.01 / 0.0 / 0.0	27.01	L1	-28.99
10.998 MHz	25.27 Qp	1.82 / -0.09 / 0.0 / 0.0	27.0	L1	-33.0
6.545 MHz	23.5 Qp	1.34 / -0.05 / 0.0 / 0.0	24.8	L1	-35.2
29.697 MHz	16.3 Qp	3.0 / -0.15 / 0.0 / 0.0	19.15	L1	-40.85

Tested by: Greg Jakubowski (Printed) — G Jakubowski (Signature)

Reviewed by: Joel T Schneider (Printed) — Joel T. Schneider (Signature)

CONDUCTED EMISSIONS

Test Report #:	NC72121382 Run 5	Test Area:	STS		
EUT Model #:	RF-CHW-ITI-16-S	Date:	11/1/2016		
EUT Serial #:	5555	EUT Power:	110V / 60Hz	Temperature:	16.0 °C
Test Method:	FCC 15.207			Air Pressure:	99.0 kPa
Customer:	Cinch Systems Inc.			Rel. Humidity:	51.0 %
EUT Description:	Hardwire wireless converter home security sensor. 16 channel				
Notes:					
Data File Name:	21382.dat			Page:	4 of 5

Measurement summary for limit2: FCC 15.207 Avg (Av)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV)	EUT Lead	DELTA2 FCC 15.207 Avg
21.111 MHz	35.91 Av	2.54 / -0.19 / 0.0 / 0.0	38.26	L1	-11.74
720.313 kHz	32.13 Av	0.32 / -0.17 / 0.0 / 0.0	32.27	L1	-13.73
21.236 MHz	33.06 Av	2.55 / -0.19 / 0.0 / 0.0	35.42	N	-14.58
735.938 kHz	30.25 Av	0.32 / -0.17 / 0.0 / 0.0	30.4	N	-15.6
489.844 kHz	28.66 Av	0.25 / -0.2 / 0.0 / 0.0	28.71	L1	-17.46
23.084 MHz	29.06 Av	2.66 / -0.19 / 0.0 / 0.0	31.53	N	-18.47
173.438 kHz	36.12 Av	0.13 / -0.25 / 0.0 / 0.0	36.0	L1	-18.79
239.844 kHz	32.99 Av	0.17 / -0.24 / 0.0 / 0.0	32.92	L1	-19.18
24.595 MHz	25.5 Av	2.76 / -0.18 / 0.0 / 0.0	28.08	L1	-21.92
450.781 kHz	24.68 Av	0.24 / -0.21 / 0.0 / 0.0	24.71	N	-22.15
4.533 MHz	22.64 Av	1.1 / -0.03 / 0.0 / 0.0	23.72	N	-22.28
985.938 kHz	23.35 Av	0.38 / -0.14 / 0.0 / 0.0	23.59	L1	-22.41
3.677 MHz	22.53 Av	0.96 / -0.02 / 0.0 / 0.0	23.47	N	-22.53
1.029 MHz	23.11 Av	0.39 / -0.13 / 0.0 / 0.0	23.37	N	-22.63
2.384 MHz	22.36 Av	0.7 / 0.0 / 0.0 / 0.0	23.05	N	-22.95
16.341 MHz	23.94 Av	2.23 / -0.14 / 0.0 / 0.0	26.02	L1	-23.98
1.732 MHz	21.27 Av	0.57 / -0.04 / 0.0 / 0.0	21.8	N	-24.2
5.088 MHz	24.59 Av	1.18 / -0.03 / 0.0 / 0.0	25.74	N	-24.26
263.281 kHz	26.83 Av	0.18 / -0.23 / 0.0 / 0.0	26.77	N	-24.55
16.088 MHz	22.48 Av	2.21 / -0.14 / 0.0 / 0.0	24.55	N	-25.45
1.607 MHz	19.58 Av	0.54 / -0.05 / 0.0 / 0.0	20.06	L1	-25.94
2.935 MHz	16.55 Av	0.8 / -0.01 / 0.0 / 0.0	17.34	L1	-28.66
10.998 MHz	19.25 Av	1.82 / -0.09 / 0.0 / 0.0	20.98	L1	-29.02
153.906 kHz	25.38 Av	0.12 / -0.25 / 0.0 / 0.0	25.25	N	-30.54
6.545 MHz	16.2 Av	1.34 / -0.05 / 0.0 / 0.0	17.5	L1	-32.5
29.697 MHz	12.35 Av	3.0 / -0.15 / 0.0 / 0.0	15.2	L1	-34.8

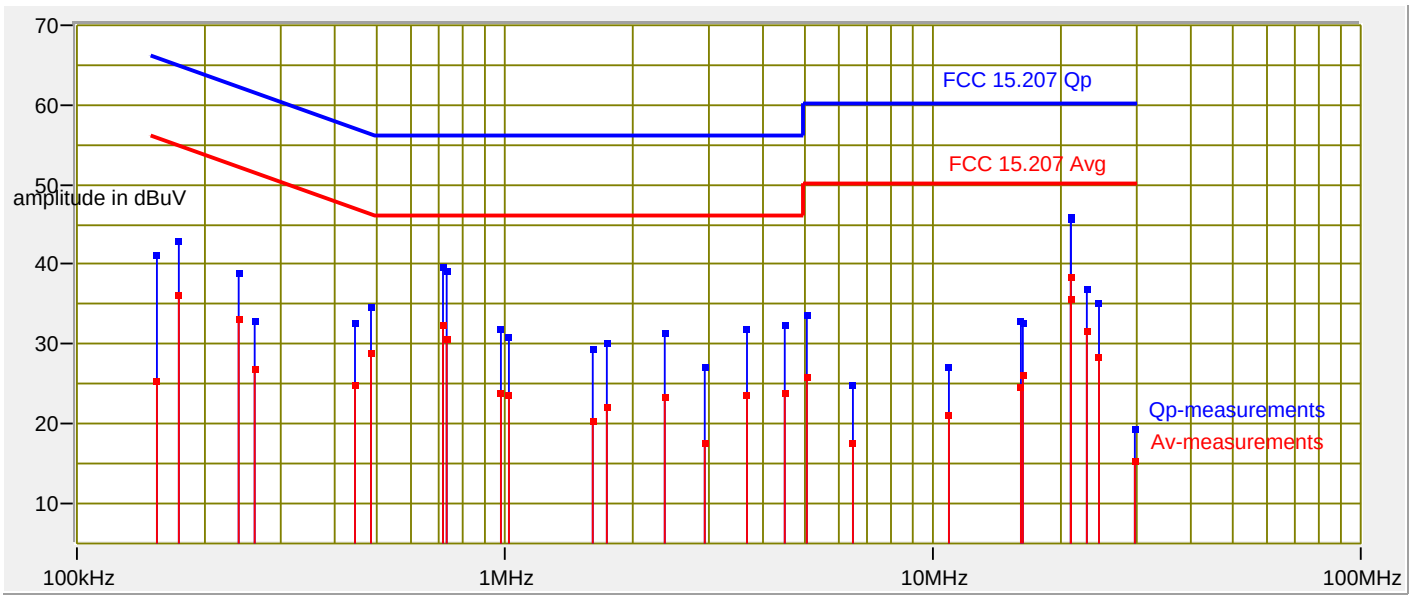
Tested by: Greg Jakubowski (Printed) _____ (Signature)

Reviewed by: Joel T Schneider (Printed) _____ (Signature)

CONDUCTED EMISSIONS

Test Report #:	NC72121382 Run 5	Test Area:	STS		
EUT Model #:	RF-CHW-ITI-16-S	Date:	11/1/2016		
EUT Serial #:	5555	EUT Power:	110V / 60Hz	Temperature:	16.0 °C
Test Method:	FCC 15.207			Air Pressure:	99.0 kPa
Customer:	Cinch Systems Inc.			Rel. Humidity:	51.0 %
EUT Description:	Hardwire wireless converter home security sensor. 16 channel				
Notes:					
Data File Name:	21382.dat			Page:	5 of 5

Graph:



Tested by: Greg Jakubowski (Printed) — (Signature)

Reviewed by: Joel T Schneider (Printed) — (Signature)

Equipment Under Test (EUT) Test Operation Mode:

The device under test was operated under the following conditions during immunity testing :

☐ - Standby

☐ - Test program (H - Pattern)

☐ - Test program (color bar)

☐ - Test program (customer specific)

☐ - Practice operation

■ - Sends continuous packets- carrier with modulation

Configuration of the device under test:

■ - See Appendix A and test setup photos

☐ - See Product Information Form(s) in Appendix B

DEVIATIONS FROM STANDARD:
None.

GENERAL REMARKS:
None

Modifications required to pass:
■ None
☐ As indicated on the data sheet(s)

Test Specification Deviations: Additions to or Exclusions from:
■ None
☐ As indicated in the Test Plan

SUMMARY:
The requirements according to the technical regulations are
■ - met and the device under test does fulfill the general approval requirements.
☐ - **not** met and the device under test does **not** fulfill the general approval requirements..

EUT Received Date: 28 October 2016
Condition of EUT: Normal
Testing Start Date: 28 October 2016
Testing End Date: 02 November 2016

TÜV SÜD AMERICA INC

Approved by:
Joel T Schneider
Senior EMC Engineer

Tested by:
Greg Jakubowski
Senior EMC Technician

Appendix A

EMC Test Plan

Form

EMC Test Plan and Product Information Form

PLEASE COMPLETE THIS DOCUMENT IN FULL, ENTERING N/A IF THE FIELD IS NOT APPLICABLE. IF TESTING RESULTS IN MODIFICATIONS TO THE EQUIPMENT, PLEASE SUBMIT A REVISED VERSION OF THIS DOCUMENT INDICATING THOSE MODIFICATIONS.
NOTE: This information will be input into your test report as shown below.

Company:	Cinch Systems Inc.		
Address: (*incl City, State, ZIP*)	12075 43rd St NE Suite 300		
	St Michael MN 55376		
Contact:	Joel Christianson	Position:	CEO
Phone - Office:	763-497-1064	Cell:	
E-mail Address:	Jeol.christianson@cinchsystems.com	Form completion date:	10-21-26

General Equipment Description -- *NOTE: This info will be input into your test report as shown below.*			
EUT Description	Hardwire wireless converter home security sensor 8 and 16 channels		
EUT Name			
Model No.:	RF-CHW-ITI-16-S, QS7130, RF-CHW-ITI-8-S, QS7131,	Serial No.:	
Product Options:			
Configurations to be tested:			

Equipment Modification (*If applicable, indicate modifications since EUT was last tested. If modifications are made during this testing, submit revised version of this document after testing is complete.)*	
Modifications since last test:	
Modifications made during test:	

EUT Specifications and Requirements

Length: _____ Width: _____ Height: _____ Weight: _____

Power Requirements

Regulations require testing to be performed at typical power ratings in the countries of intended use. (i.e., European power is typically 230 VAC 50 Hz or 400 VAC 50 Hz, single and three phase, respectively)

Voltage: 16 (If battery powered, make sure battery life is sufficient to complete testing.)

# of Phases: _____

Current (Amps/phase(max)): 1A Current (Amps/phase(nominal)): 1A

Other _____

Oscillator Frequencies (Please list any and all internally generated frequencies of the Product - clocks, CPUs, etc. ***The highest frequency will determine the upper frequency range to be tested***.)

Frequency (kHz, MHz, GHz)	***Description of Use***
9.983438 MHz	Cristal Oscillator use for RF wireless security sensor for modulations

Form

EMC Test Plan and Product Information Form

Typical Installation and/or Operating Environment (ie. Hospital, Small Business, Industrial/Factory, etc.)
Hardwire wireless converter home security sensor 8 and 16 channels

Test Objective(s):
Please indicate (x) the tests to be performed, entering the applicable standard(s) where noted.

___	EMC Directive	Std(s):
___	RED Directive	Std(s):
___	Medical Device Directive	Std(s):
___	Vehicle	Std(s):
___	Ag Directive	Std(s):

Countries Needed ***(common standards shown below - "x" those applicable)*:**

X	FCC (USA):	Class	___ A (Industrial)	X	B (Residential)	
___	VCCI (Japan):	Class	___ A (Industrial)	___	B (Residential)	
___	BSMI (Taiwan):	Class	___ A (Industrial)	___	B (Residential)	(Separate Report required)
___	Canada:	Class	___ A (Industrial)	___	B (Residential)	
___	Australia	Class	A (Industrial)		B (Residential)	
___	Korea:	Std(s):				
___	Other:	Std(s):				

Other Special Requirements (i.e. Water access, compressed air, etc)
N/A

Emissions Testing Operating Modes.
Describe what the product is doing during testing. Describe how the product will be exercised during emissions testing and what software is running, if any. If testing multiple operating modes, please describe each one. If testing only one operating mode out of several, please describe why it is considered the worst-case. In addition to operating modes, all ports must be populated to achieve the worst case condition.

Operating Mode 1.	Transmit continuous packet
Operating Mode 2.	

Immunity Testing Operating Modes.
If different than operating mode during emissions testing, describe what the product is doing during test. Describe how the product will be exercised during immunity testing and what software is running, if any. If testing multiple operating modes, please describe each one. If testing only one operating mode out of several, please describe why it is considered the worst-case. In addition to operating modes, all ports must be populated to achieve the worst case condition.

Cycle Time of Product:	
Operating Mode 1.	
Operating Mode 2.	

Form

EMC Test Plan and Product Information Form

Immunity Testing Performance Criteria and Pass/Fail Criteria.
For immunity testing, it is very important that performance criteria be defined. Please describe what parameters can be monitored, as well as their tolerances, to ensure that the product is operating properly during the immunity testing. Explain what the test operator should monitor during the testing to determine if the product is operating within specified parameters.

N/A

EUT Interface Ports and Cables
In order to verify all configurations in the report properly, it is generally necessary to populate all ports on the equipment under test. If any ports are to remain unpopulated, the justification for leaving them unpopulated should be noted. (e.g., "diagnostic use only"). Please note that any unpopulated port will be documented in the report, which may exclude it from the scope of compliance as detailed in that report. Please provide as many cables as possible for testing adding rows as needed. ***The cable length should represent the maximum length of cable that you specify that can be attached to the product in your instruction manual. TUV SUD AMERICA requires a minimum of 15 feet that will connect to any support equipment that you do not want included in the test field.***

Type	*Length tested (in meters)*	*Qty*	*Shielding*		
			Yes	*No*	*Type*
***EXAMPLE**: Ethernet*	*6*	*2*			

Equipment Under Test (EUT) System Components
List and describe all major components which are part of the EUT. For FCC & Taiwan testing a minimum configuration is required.

Description	*Model #*	*Serial #*	*FCC ID #*

Customer Supplied Support Equipment
List and describe all support equipment which is not part of the EUT but that you are providing to exercise and monitor your product. Support equipment is defined as only needed for testing and is not part of the final product to be delivered to the customer (i.e. peripherals, simulators, etc) This information is required for FCC & Taiwan testing.

Critical EMI Components (Capacitors, ferrites, etc.)

Description	*Manufacturer*	*Part # or Value*	*Qty*	*Component # / Location*

Form

EMC Test Plan and Product Information Form

EMC Critical Detail Describe other EMC Design details used to reduce high frequency noise.
N/A

System Configuration Block Diagram Provide a line drawing identifying the EUT, simulators, support equipment, I/O cables, power cables, and any other pertinent components to be used during testing. Use a dashed line to separate the equipment in the testing field versus equipment outside testing field.