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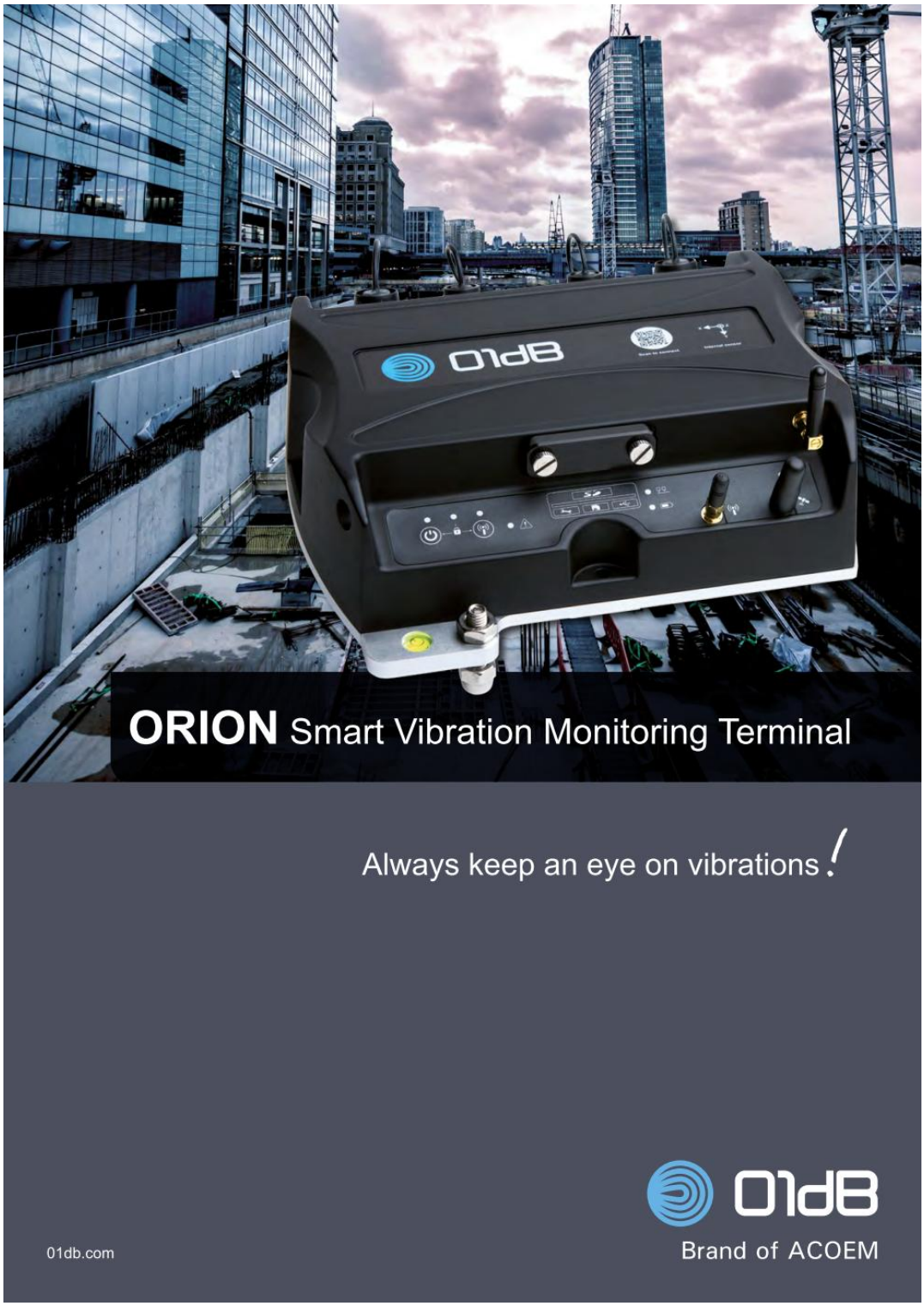
Laboratoire de Moirans
Z.I. Centr'Alp
170, Rue de Chatagnon
38430 MOIRANS - FRANCE

GENERAL INFORMATION

FCCID: **2AC3Z-VMT1002000**

1.1. Product description



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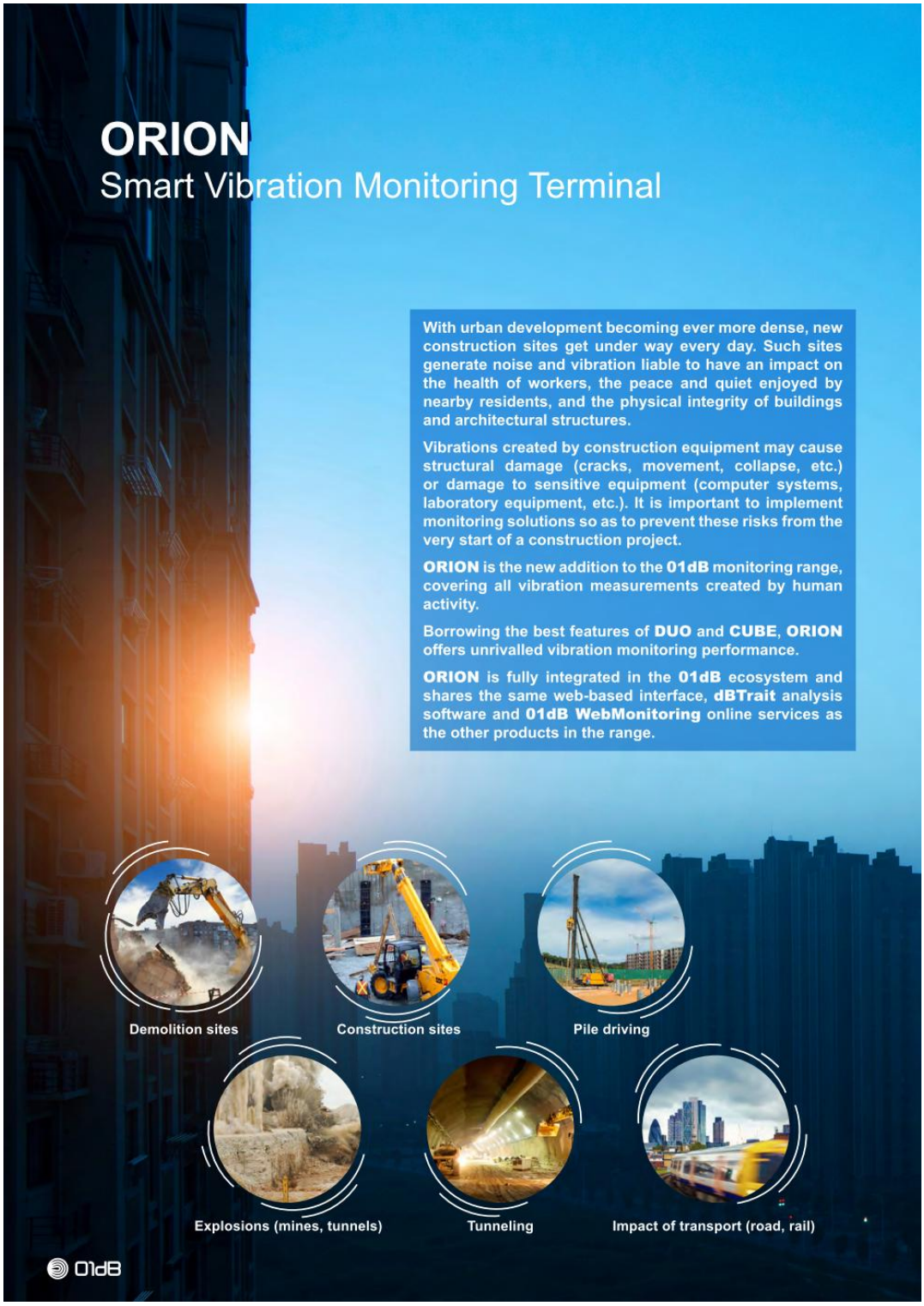

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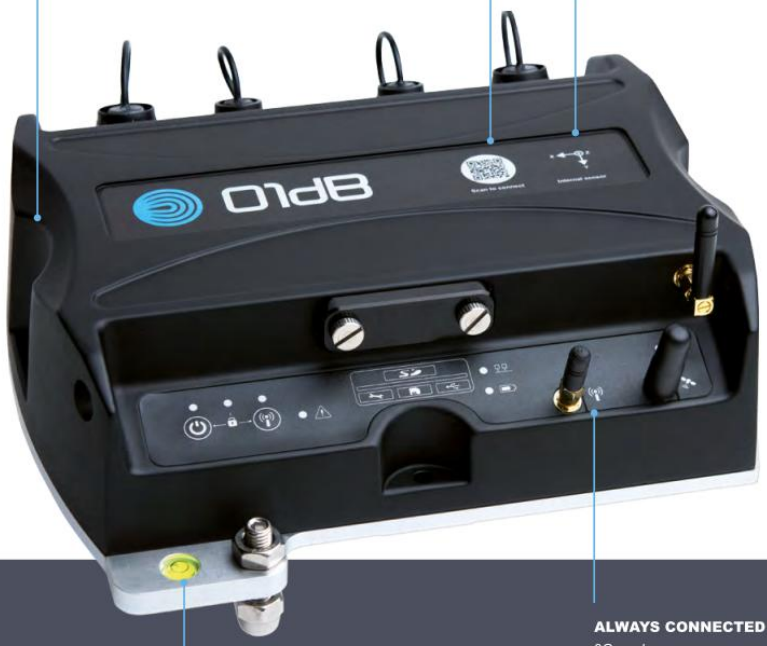
With ORION, monitor vibrations differently!

ORION offers unrivalled vibration monitoring features: all-in-one (integrated sensor, 3G modem, Wi-Fi, GPS), robust, waterproof, easy to configure and use, seven measurement channels, smart integration of vibration standards, etc.

ROBUST AND HARD-WEARING
Strong casing
IP65 waterproof level
Robust connectors
Battery lifetime of 30 hours

EASY TO CONFIGURE
QR code to log on
Mobile application
Web interface

METROLOGICAL PERFECTION
Three internal vibration channels
Three external vibration channels
One pressure microphone channel
Five integrated standards
(including DIN 4150-3 and BS 5228-4)
Smart alarms thresholds



EASY TO INSTALL
Spirit level
Can be mounted horizontally or vertically
Automatic start-up of measurements

ALWAYS CONNECTED
3G modem
Wi-Fi
Ethernet
GPS
Advanced Push mode
HTTP commands for integrators

With a view to improving productivity in the field, 01dB offers a comprehensive, coherent and metrologically flawless acoustic and vibration monitoring solution.

01dB

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1.2. Tested System Details

Power supply:
During all the tests, EUT is supplied by V_{nom}: 240 / 50Hz VAC or 120 / 60Hz (Primary of Supply 2 & Supply3)
For measurement with different voltage, it will be presented in test method.

Name	Type	Rating	Reference / Sn	Comments
Supply1	☐ AC ☐ DC ☑ Battery	3.75V	1S3P-INT176065	/
Supply2	☑ AC ☑ DC ☐ Battery	100-240 | 50/60Hz	ZLD1201500 (Giga-Concept)	External power supply Not Water proof
Supply3	☑ AC ☑ DC ☐ Battery	100-240 | 50/60Hz	LPF-25-12 (Mean Well)	External power supply Water proof

Inputs/outputs - Cable:

Access	Type		Ref cable	Length used (m)	Declared <3m	Shielded	Under test	Comments
Supply1	Power (12V _ 1.3A)		/		☐	☐	☑	/
Access1	GPS Antenna		/	/	☐	☑	☑	/
Access2	WIFI Antenna		/	/	☐	☑	☑	/
Access3	GSM Antenna		/	/	☐	☑	☑	/
Access4	TTL output		VMT1010000	3	☐	☑	☑	/
Access5	Ethernet – type Cat5e (100Mbps)		VMT1009000A	9.9	☐	☑	☑	/
Access6	Ext Sensors	BNC cable splitter for external sensor	VMT1011000	1.5	☐	☑	☑	/
		3 x Addition BNC extenders	VMT1036000	10 each	☐	☑	☑	/
Access7	USB port (Type Mini-A Femal)		/	/	☐	☐	☐	/
Access8	Ground		/	/	☐	☐	☑	/
Access9	Sim Slot		/	/	☐	☐	☐	/

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Antennas:

Type	Antenna ID	Reference	Sn	Gain (dBi)	Comments
GSM Antenna	Antenna 1	TAOGLAS TG.22.112	/	2.5	/
GPS Antenna	Antenna 2	NEALCOM 668-0006-52	01351085	/	/
Wifi Antenna	Antenna 3	RF Solution ANT-24G-S21-SMA	/	0	/

NC: Not communicated by customer

Auxiliary equipment used during test:

Type	Reference	Sn	Comments
GPS variable gain repeater	GPS Sources GPSRKL1-V-P230/5	/	/
Laptop	Notebook Computer W550EU	/	/
Velocimeter Wilcoxon 793V	Model 793V	19974	/
Velocimeter Wilcoxon 793V	Model 793V	19976	/
Velocimeter Wilcoxon 793V	Model 793V	19975	/
Digital Radiocommunication Tester	CMU200	A2440006	/

Radio frequency - Equipment information:

Type:	**WIFI**				
RF Module	APM6998				
Frequency band:	[2400 – 2483.5] MHz				
Sub-band REC7003:	Annex 3 (a)				
Standard:	☑ 802.11b	☑ 802.11g	☑ 802.11n HT20	☐ 802.11n HT40	
Spectrum Modulation:	☑ DSSS		☑ OFDM		
Number of Channel:	13				
Spacing channel:	5 MHz				
Channel bandwidth:	☑ 20MHz		☐ 40MHz		
Antenna Type:	☐ Integral	☑ External	☐ Dedicated		
Antenna connector:	☑ Yes	☐ No	☐ Temporary for test		
Transmit chains:	☑ 1	☐ 2	☐ 3	☐ 4	
	☑ Single antenna	☐ Symmetrical	☐ Asymmetrical		
	Gain 1: 0 dBi	Gain 2: dBi	Gain 3: dBi	Gain 4: dBi	Accumuled Gain: dBi
Beam forming gain:	☐ Yes: dB		☑ No		
Receiver chains	☑ 1	☐ 2	☐ 3	☐ 4	
Type of equipment:	☑ Stand-alone	☐ Plug-in	☐ Combined		
Ad-Hoc mode:	☑ Yes		☐ No		
Adaptivity mode:	☑ Yes (Load Based)	☐ Off mode	☐ No		
	Clear Channel Assessment Time		/		
Duty cycle:	☑ Continuous duty	☐ Intermittent duty	☐ 100% duty		
Equipment type:	☑ Production model		☐ Pre-production model		
Operating temperature range:	Tmin:	☑ -20°C	☐ 0°C	☐ X°C	
	Tnom:	20°C			
	Tmax:	☐ 35°C	☑ 55°C	☐ X°C	
Type of power source:	☑ AC power supply	☐ DC power supply	☑ Battery		
Operating voltage range:	Vnom:	☑ 230V/50Hz or 120V /60Hz	☑ 4.2 Vdc		
Geo-location capability:	☐ Yes (The geographical location determined by the equipment is not accessible to the end user as defined in section 4.3.2.12.2 of ETSI EN 300 328 V1.9.1 standard)		☑ No		

NC: Not communicated by customer

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CHANNEL PLAN	
802.11b / 802.11g / 802.11n HT20	
Channel	Frequency (MHz)
Cmin: 1	**2412**
2	2417
3	2422
4	2427
5	2432
Cmid: 6	**2437**
7	2442
8	2447
9	2452
10	2457
Cmax: 11	2462

DATA RATE		
802.11b		
Data Rate (Mbps)	**Modulation Type**	**Modulation Worst Case**
1	DBPSK	☐
2	DQPSK	☐
5.5	DQPSK	☐
11	CCK	☑

DATA RATE		
802.11g		
Data Rate (Mbps)	**Modulation Type**	**Modulation Worst Case**
6	BPSK	☐
9	BPSK	☐
12	QPSK	☐
18	QPSK	☐
24	16-QAM	☐
36	16-QAM	☑
48	64-QAM	☐
54	64-QAM	☐

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DATA RATE						
802.11n HT20 (Table 1)						
Available for EUT	**MCS Index**	**Spatial streams**	**Modulation**	**Data Rate (Mbps)**		**Worst Case Modulation**
				(GI = 800ns)	**(GI = 400ns)**	
☑	0	1	BPSK	6.5	7.2	☐
☑	1	1	QPSK	13	14.4	☑
☑	2	1	QPSK	19.5	21.7	☐
☑	3	1	16-QAM	26	28.9	☐
☑	4	1	16-QAM	39	43.3	☐
☑	5	1	64-QAM	52	57.8	☐
☑	6	1	64-QAM	58.5	65	☐
☑	7	1	64-QAM	65	72.2	☐
☐	8	2	BPSK	13	14.4	☐
☐	9	2	QPSK	26	28.9	☐
☐	10	2	QPSK	39	43.3	☐
☐	11	2	16-QAM	52	57.8	☐
☐	12	2	16-QAM	78	86.7	☐
☐	13	2	64-QAM	104	115.6	☐
☐	14	2	64-QAM	117	130.3	☐
☐	15	2	64-QAM	130	144.4	☐
☐	16	3	BPSK	19.5	21.7	☐
☐	17	3	QPSK	39	43.3	☐
☐	18	3	QPSK	58.5	65	☐
☐	19	3	16-QAM	78	86.7	☐
☐	20	3	16-QAM	117	130	☐
☐	21	3	64-QAM	156	173.3	☐
☐	22	3	64-QAM	175.5	195	☐
☐	23	3	64-QAM	195	216.7	☐
☐	24	4	BPSK	26	28.9	☐
☐	25	4	QPSK	52	57.8	☐
☐	26	4	QPSK	78	86.7	☐
☐	27	4	16-QAM	104	115.6	☐
☐	28	4	16-QAM	156	173.3	☐
☐	29	4	64-QAM	208	231.1	☐
☐	30	4	64-QAM	234	260	☐
☐	31	4	64-QAM	260	288.9	☐

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DATA RATE									
802.11n HT20 (Table 2)									
Available for EUT	MCS Index	Spatial streams	Modulation				Data Rate (Mbps)		Worst Case Modulation
							(GI = 800ns)	(GI = 400ns)	
☐	32	1	BPSK	-	-	-	-	-	☐
☐	33	2	16-QAM	QPSK	-	-	39	43.3	☐
☐	34	2	64-QAM	QPSK	-	-	52	57.8	☐
☐	35	2	64-QAM	16-QAM	-	-	65	72.2	☐
☐	36	2	16-QAM	QPSK	-	-	58.5	65	☐
☐	37	2	64-QAM	QPSK	-	-	78	86.7	☐
☐	38	2	64-QAM	16-QAM	-	-	97.5	108.3	☐
☐	39	3	16-QAM	QPSK	QPSK	-	52	57.8	☐
☐	40	3	16-QAM	16-QAM	QPSK	-	65	72.2	☐
☐	41	3	64-QAM	QPSK	QPSK	-	65	72.2	☐
☐	42	3	64-QAM	16-QAM	QPSK	-	78	86.7	☐
☐	43	3	64-QAM	16-QAM	16-QAM	-	91	101.1	☐
☐	44	3	64-QAM	64-QAM	QPSK	-	91	101.1	☐
☐	45	3	64-QAM	64-QAM	16-QAM	-	104	115.6	☐
☐	46	3	16-QAM	QPSK	QPSK	-	78	86.7	☐
☐	47	3	16-QAM	16-QAM	QPSK	-	97.5	108.3	☐
☐	48	3	64-QAM	QPSK	QPSK	-	97.5	108.3	☐
☐	49	3	64-QAM	16-QAM	QPSK	-	117	130	☐
☐	50	3	64-QAM	16-QAM	16-QAM	-	136.5	151.7	☐
☐	51	3	64-QAM	64-QAM	QPSK	-	136.5	151.7	☐
☐	52	3	64-QAM	64-QAM	16-QAM	-	156	173.3	☐
☐	53	4	16-QAM	QPSK	QPSK	QPSK	65	72.2	☐
☐	54	4	16-QAM	16-QAM	QPSK	QPSK	78	86.7	☐
☐	55	4	16-QAM	16-QAM	16-QAM	QPSK	91	101.1	☐
☐	56	4	64-QAM	QPSK	QPSK	QPSK	78	86.7	☐
☐	57	4	64-QAM	16-QAM	QPSK	QPSK	91	101.1	☐
☐	58	4	64-QAM	16-QAM	16-QAM	QPSK	104	115.6	☐
☐	59	4	64-QAM	16-QAM	16-QAM	16-QAM	117	130	☐
☐	60	4	64-QAM	QPSK	QPSK	QPSK	104	115.6	☐
☐	61	4	64-QAM	16-QAM	16-QAM	QPSK	117	130	☐
☐	62	4	64-QAM	16-QAM	16-QAM	16-QAM	130	144.4	☐
☐	63	4	64-QAM	64-QAM	64-QAM	QPSK	130	144.4	☐
☐	64	4	64-QAM	64-QAM	64-QAM	16-QAM	143	158.9	☐
☐	65	4	16-QAM	QPSK	QPSK	QPSK	97.5	108.3	☐
☐	66	4	16-QAM	16-QAM	QPSK	QPSK	117	130	☐
☐	67	4	16-QAM	16-QAM	16-QAM	QPSK	136.5	151.7	☐
☐	68	4	64-QAM	QPSK	QPSK	QPSK	117	130	☐
☐	69	4	64-QAM	16-QAM	QPSK	QPSK	136.5	151.7	☐
☐	70	4	64-QAM	16-QAM	16-QAM	QPSK	156	173.3	☐
☐	71	4	64-QAM	16-QAM	16-QAM	16-QAM	175.5	195	☐
☐	72	4	64-QAM	64-QAM	QPSK	QPSK	156	173.3	☐
☐	73	4	64-QAM	64-QAM	16-QAM	QPSK	175.5	195	☐
☐	74	4	64-QAM	64-QAM	16-QAM	16-QAM	195	216.7	☐
☐	75	4	64-QAM	64-QAM	64-QAM	QPSK	195	216.7	☐
☐	76	4	64-QAM	64-QAM	64-QAM	16-QAM	214.5	238.3	☐

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3G information			
RF module:	Telit HE910-G		
UMTS Band VIII:	☑ UMTS VIII 882 MHz to 913 MHz (TX) and 927 MHz to 960 MHz (IDLE)		
Power Class:	24 dBm		
Antenna Type:	☐ Integral	☑ External	☐ Dedicated
Antenna gain:	2.5 dBi		
UMTS Band I:	☑ UMTS I 1922 MHz to 1978 MHz (TX) and 2112 MHz to 2168 MHz (IDLE)		
Power Class:	24 dBm		
Antenna Type:	☐ Integral	☑ External	☐ Dedicated
Antenna gain:	2.5 dBi		
Type of equipment:	☑ Stand-alone	☐ Plug-in	☐ Combined
Standby mode:	☑ Yes	☐ No	
Equipment intended use:	☑ Fixed	☐ Mobile	
Equipment type:	☑ Production model	☐ Pre-production model	
Operating temperature range:	Tnom:	20 °C	
Type of power source:	☐ AC power supply	☑ DC power supply	☑ Battery

GPS			
RF module:	µBlox MAX-M8Q		
Frequency band:	NC		
Receiver classification § 4.1.1	☐1	☑2	☐3
Receiver bandwidth:	NC		
Antenna type:	☑External:	☐Internal:	
Antenna gain:	NC		
Equipment type:	☑ Production model	☐ Prototype	

NC: Not communicated by customer

1.3. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 or ANSI C63.10, FCC Part 15 Subpart C.
Radiated testing was performed at an antenna to EUT distance of 10 meters. During testing, all equipment's and cables were moved relative to each other in order to identify the worst case set-up.

1.4. Test facility

Tests have been performed **August 30, 2016 to September 22, 2016**.

This test facility has been fully described in a report and accepted by FCC as compliant with the radiated and AC line conducted test site criteria in ANSI C63.4 and ANSI C63.10 (registration number 94821).
This test facility has also been accredited by COFRAC (French accreditation authority for European Union test lab accreditation organization) according to NF EN ISO/IEC 17025, accreditation number 1-1633 as compliant with test site criteria and competence in 47 CFR Part 15/ANSI C63.4 and EN55022/CISPR22 norms for 89/336/EEC European EMC Directive application. All pertinent data for this test facility remains unchanged.