Digital Control, Inc.

TEST REPORT FOR

DigiTrak Falcon Short Range Transmitter
Model: BTM*

***(See Appendix A for Manufacturers Declaration)**

Tested to The Following Standards:

FCC Part 15 Subpart C Section

15.209

Report No.: 108253-3

Date of issue: May 16, 2023

This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

Test Certificate # 803.01

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

Digital Control, Inc.
19625 62nd Ave S. Ste B103
Kent, WA 98032

Representative: Ashley Olson
Customer Reference Number: 905733

REPORT PREPARED BY:

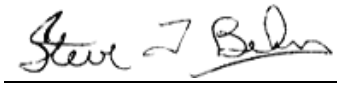
Lisa Bevington
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 108253

DATE OF EQUIPMENT RECEIPT: March 21, 2023
DATE(S) OF TESTING: March 21. 28 & 31, 2023
April 13 & 19, 2023

Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the equipment provided by the client, tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.



Steve Behm
Director of Quality Assurance & Engineering Services
CKC Laboratories, Inc.

Test Facility Information

Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S):
CKC Laboratories, Inc.
22116 23rd Drive S.E. Suite A
Bothell, WA 98021

Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.03.20
EMITest Immunity	5.03.19

Site Registration & Accreditation Information

Location	*NIST CB #	FCC	Canada	Japan
Canyon Park, Bothell, WA	US0103	US1024	3082C	A-0136
Brea, CA	US0103	US1024	3082D	A-0136
Fremont, CA	US0103	US1024	3082B	A-0136
Mariposa, CA	US0103	US1024	3082A	A-0136

*CKC's list of NIST designated countries can be found at: https://standards.gov/cabs/designations.html

SUMMARY OF RESULTS

Standard / Specification: FCC Part 15 Subpart C - 15.209

Test Procedure	Description	Modifications	Results
15.215(c)	Occupied Bandwidth	NA	Pass
15.209	Field Strength of Fundamental	NA	Pass
15.209	Field Strength of Spurious Emissions	NA	Pass
15.207	AC Conducted Emissions	NA	NA1

NA = Not Applicable
NA1 = Manufacturer declares EUT is battery powered only.

ISO/IEC 17025 Decision Rule
The equipment sample utilized for testing is selected by the manufacturer. The declaration of pass or fail herein is a binary statement for simple acceptance rule (ILAC G8) based upon assessment to the specification(s) listed above, without consideration of measurement uncertainties. For performance related tests, equipment was monitored for specified criteria identified in that section of testing.

Modifications During Testing

This list is a summary of the modifications made to the equipment during testing.

Summary of Conditions
No modifications were made during testing.

Modifications listed above must be incorporated into all production units.

Conditions During Testing

This list is a summary of the conditions noted to the equipment during testing.

Summary of Conditions
None

EQUIPMENT UNDER TEST (EUT)

During testing, numerous configurations may have been utilized. The configurations listed below support compliance to the standard(s) listed in the Summary of Results section.

Configuration 1

Equipment Tested:

Device	Manufacturer	Model #	S/N
DigiTrak Falcon Short Range Transmitter	Digital Control, Inc.	BTM (FT2XS variant)	90001301

Support Equipment:

Device	Manufacturer	Model #	S/N
None			

Appendix A: Manufacturer Declaration and Functional Description

The DigiTrak Falcon Short Range Transmitter, model BTM, is a low frequency induction device, used for guiding purposes during a horizontal directional drilling operation. Model variants FT2XS and FT1XS are electrically and mechanically identical to each other. The devices differ only in labeling and frequency of operation; the FT1XS operates on a single band at 9-13.5khz. The FT2XS operates at 4.5- 43khz. All testing of FT2XS is representative of testing of the FT1XS at 9-13khz, per the manufacturer.

General Product Information:

Product Information	Manufacturer-Provided Details
Equipment Type:	Stand-Alone Equipment, Low Power Inductive Device
Modulation Type(s):	FSK
Maximum Duty Cycle:	Tested as 100%
Operating Frequency Range	4.5kHz to 43kHz (FTS2XS) 9 to 13kHz (FT1XS) – Note, this variant was not tested
Antenna Information:	Ferrite rod with wire turns (50µH per manufacturer)
Antenna Connection Type:	Integral
Nominal Input Voltage:	Battery, 1.5VDC
Firmware / Software used for Test:	Boot: 4.1.0.0 Main: 2.0.3.1
The validity of results is dependent on the stated product details, the accuracy of which the manufacturer assumes full responsibility.	

FCC Part 15 Subpart C

15.215(c) Occupied Bandwidth

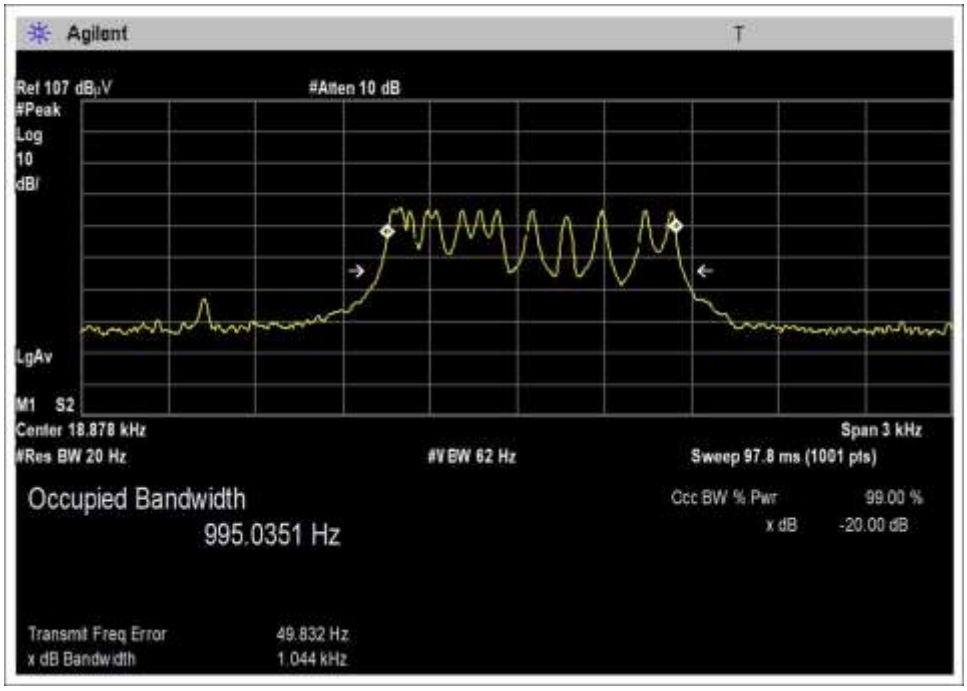
Test Setup/Conditions			
Test Location:	Bothell Lab C3	Test Engineer:	M. Atkinson
Test Method:	ANSI C63.10 (2013)	Test Date(s):	3/28/2023
Configuration:	1		
Test Setup:	The EUT is on a test bench inside a semi anechoic chamber.		

Environmental Conditions			
Temperature (ºC)	21	Relative Humidity (%):	32

Test Equipment					
Asset#	**Description**	**Manufacturer**	**Model**	**Cal Date**	**Cal Due**
02673	Spectrum Analyzer	Agilent	E4446A	3/2/2023	3/2/2025
P06011	Cable	Andrew	Heliax	5/20/2022	5/20/2024
P06515	Cable	Andrews	Heliax	5/23/2022	5/23/2024
00052	Loop Antenna	EMCO	6502	5/11/2022	5/11/2024

Test Data Summary					
Frequency Band	**Antenna Port**	**Modulation**	**Measured (kHz)**	**Limit (kHz)**	**Results**
18.9kHz	NA	FSK	1.044	None	N/A

Plot(s)



Test Setup Photo(s)

15.209 Field Strength of Fundamental

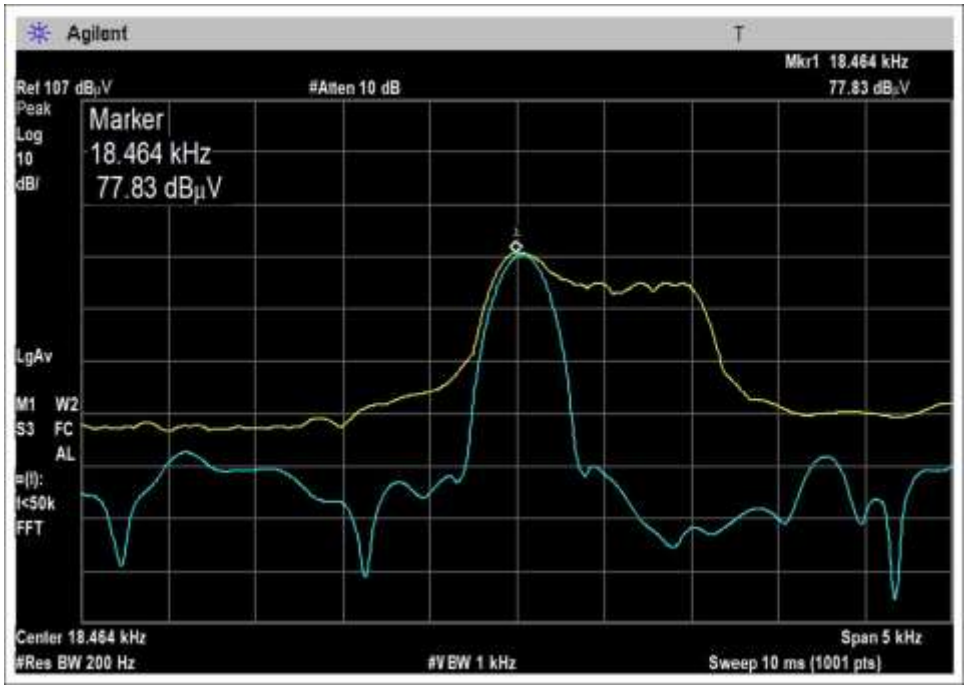
Test Setup/Conditions			
Test Location:	Bothell Lab C3	Test Engineer:	M. Atkinson
Test Method:	ANSI C63.10 (2013)	Test Date(s):	3/28/2023
Configuration:	1		
Test Setup	The EUT is on a test bench inside a semi anechoic chamber. Measurements are made at 3m test distance with distance correction applied for a 300m limit. 3 x orthogonal antenna polarities investigated, worst case reported.		

Test Data Summary - Voltage Variations

This equipment is battery powered. Power output tests were performed using a fresh battery.

Test Data Summary – Radiated Field Strength Measurement					
Frequency Band	**Modulation**	**Ant. Type**	**Field Strength (dBµV/m @ 300m)**	**Limit (dBµV/m @ 300m)**	**Results**
18.5kHz	FSK	Ferrite rod with wire turns	10.9	≤42.3	Pass

Plot(s)


Agilent
Mkr1 18.464 kHz
77.83 dBµV
Ref 107 dBµV
#Atten 10 dB
Peak
Log
10
dB/
Marker
18.464 kHz
77.83 dBµV
LgAv
M1 W2
S3 FC
AL
#(!):
f<50k
FFT
Center 18.464 kHz
#Res BW 200 Hz
#VBW 1 kHz
Span 5 kHz
Sweep 10 ms (1001 pts)

Test Setup / Conditions / Data

Test Location:	CKC Laboratories, Inc. • 22116 23rd Drive S.E., Suite A • Bothell WA 98021 • 425-402-1717		
Customer:	**Digital Control, Inc.**		
Specification:	**15.209 Radiated Emissions**		
Work Order #:	**108253**	Date:	3/28/2023
Test Type:	**Radiated Scan**	Time:	09:33:00
Tested By:	Michael Atkinson	Sequence#:	8
Software:	EMITest 5.03.20		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

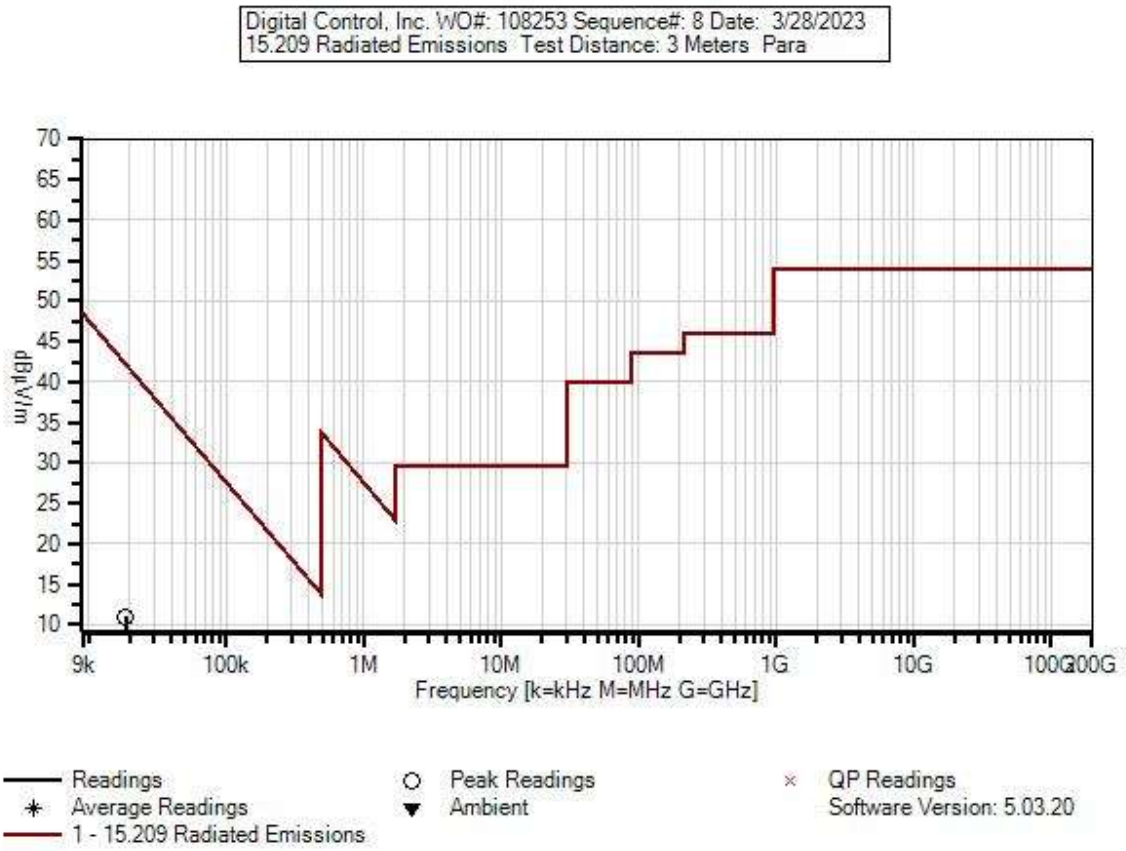
Test Environment Conditions:
Temperature: 21°C
Humidity: 32%
Pressure: 100.7kPa

Frequency Range: Fundamental

Test Method: ANSI C63.10 (2013)

Setup:
EUT is on a 80cm test bench.
EUT is transmitting at 20kHz band.
EUT has a fresh battery installed.
EUT is tested in X, Y and Z axis with the worst case reported.

3 x orthogonal axes investigated, worst case reported.



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02673	Spectrum Analyzer	E4446A	3/2/2023	3/2/2025
T1	ANP06011	Cable	Heliax	5/20/2022	5/20/2024
T2	ANP06515	Cable	Heliax	5/23/2022	5/23/2024
T3	AN00052	Loop Antenna	6502	5/11/2022	5/11/2024

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	18.464k	77.8	+0.0	+0.0	+13.1		-80.0	10.9	42.3	-31.4	Para

Test Setup Photo(s)

Test Setup, 80cm

X Axis

Y Axis

Z Axis

15.209 Radiated Emissions

Test Setup / Conditions / Data

Test Location:	CKC Laboratories, Inc. • 22116 23rd Drive S.E., Suite A • Bothell WA 98021 • 425-402-1717		
Customer:	**Digital Control, Inc.**		
Specification:	**15.209 Radiated Emissions**		
Work Order #:	**108253**	Date:	3/28/2023
Test Type:	**Radiated Scan**	Time:	08:56:51
Tested By:	Michael Atkinson	Sequence#:	7
Software:	EMITest 5.03.20		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

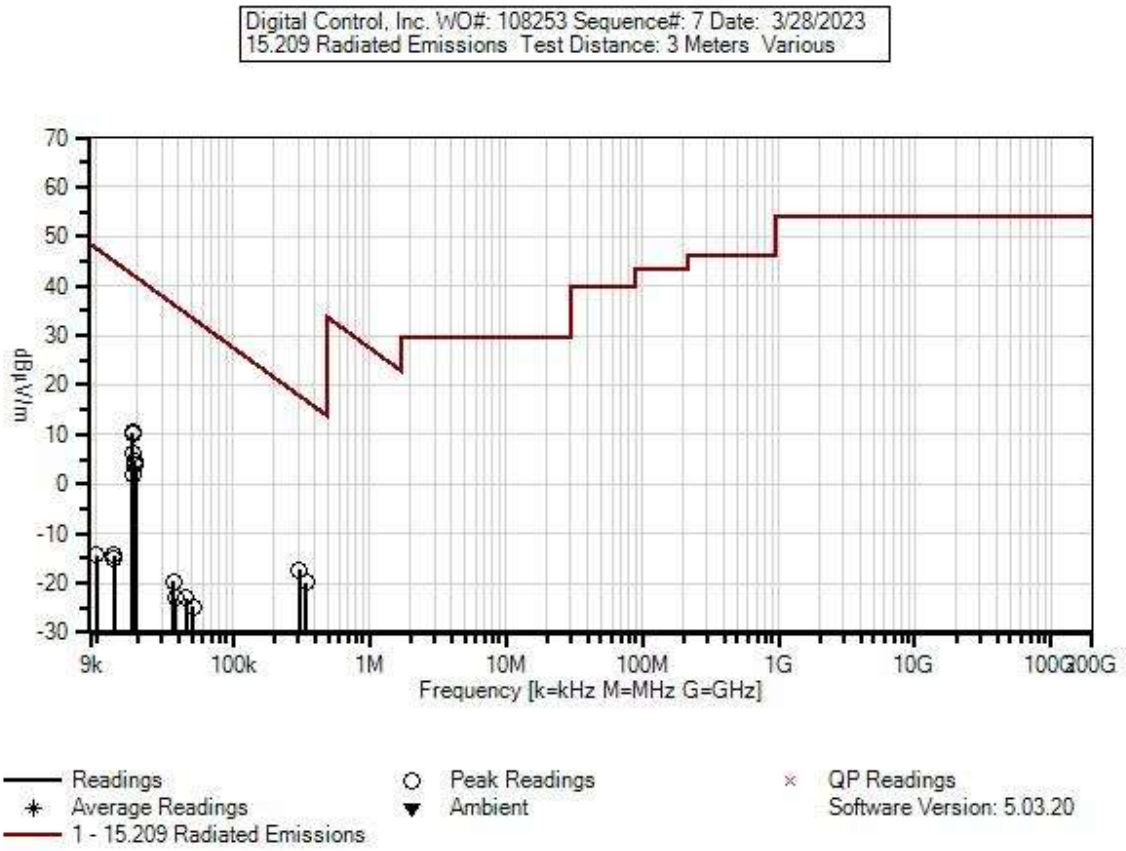
Test Environment Conditions:
Temperature: 21°C
Humidity: 32%
Pressure: 100.7kPa

Frequency Range: 9kHz-30MHz

Test Method: ANSI C63.10 (2013)

Setup:
EUT is on a 80cm test bench.
EUT is transmitting at 20kHz band.
EUT has a fresh battery installed.
EUT is tested in X, Y and Z axis with the worst case reported.

3 x orthogonal axes investigated, worst case reported.



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02673	Spectrum Analyzer	E4446A	3/2/2023	3/2/2025
T1	ANP06011	Cable	Heliax	5/20/2022	5/20/2024
T2	ANP06515	Cable	Heliax	5/23/2022	5/23/2024
T3	AN00052	Loop Antenna	6502	5/11/2022	5/11/2024

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	18.462k	77.4	+0.0	+0.0	+13.1		-80.0	10.5	42.3	-31.8	Perp
2	18.447k	77.0	+0.0	+0.0	+13.1		-80.0	10.1	42.3	-32.2	Perp
3	308.510k	53.4	+0.0	+0.0	+9.3		-80.0	-17.3	17.8	-35.1	Para
4	18.462k	72.9	+0.0	+0.0	+13.1		-80.0	6.0	42.3	-36.3	Perp
5	344.190k	50.8	+0.0	+0.0	+9.3		-80.0	-19.9	16.9	-36.8	Para
6	18.952k	71.5	+0.0	+0.0	+13.0		-80.0	4.5	42.0	-37.5	Perp
7	19.367k	70.8	+0.0	+0.0	+12.9		-80.0	3.7	41.8	-38.1	Perp
8	18.467k	68.9	+0.0	+0.0	+13.1		-80.0	2.0	42.3	-40.3	Groun
9	36.918k	49.9	+0.0	+0.0	+10.5		-80.0	-19.6	36.2	-55.8	Perp
10	45.519k	46.8	+0.0	+0.0	+10.1		-80.0	-23.1	34.4	-57.5	Para
11	50.877k	45.3	+0.0	+0.0	+9.9		-80.0	-24.8	33.5	-58.3	Perp
12	37.905k	46.6	+0.0	+0.0	+10.4		-80.0	-23.0	36.0	-59.0	Para
13	13.512k	51.1	+0.0	+0.0	+14.6		-80.0	-14.3	45.0	-59.3	Perp
14	13.512k	50.4	+0.0	+0.0	+14.6		-80.0	-15.0	45.0	-60.0	Para
15	83.448k	38.7	+0.0	+0.0	+9.6		-80.0	-31.7	29.2	-60.9	Perp
16	68.502k	40.2	+0.0	+0.0	+9.5		-80.0	-30.3	30.9	-61.2	Perp
17	77.949k	38.2	+0.0	+0.0	+9.6		-80.0	-32.2	29.8	-62.0	Groun
18	9.987k	49.5	+0.0	+0.0	+16.1		-80.0	-14.4	47.6	-62.0	Perp

Test Location:	CKC Laboratories, Inc. • 22116 23rd Drive S.E., Suite A • Bothell WA 98021 • 425-402-1717		
Customer:	**Digital Control, Inc.**		
Specification:	**15.209 Radiated Emissions**		
Work Order #:	**108253**	Date:	3/21/2023
Test Type:	**Radiated Scan**	Time:	11:35:07
Tested By:	Steven Pittsford	Sequence#:	2
Software:	EMITest 5.03.20		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

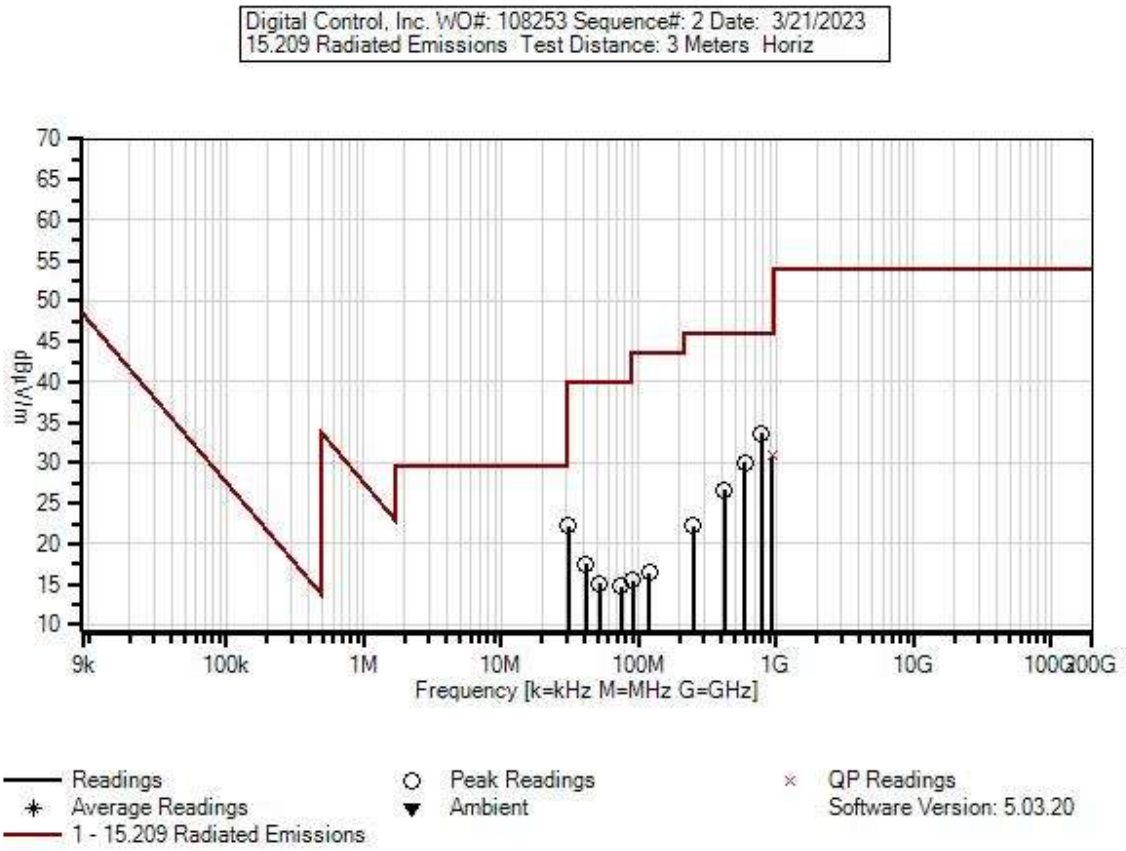
Test Conditions / Notes:

Test Environment Conditions:
Temperature: 22°C
Humidity: 41%
Pressure: 100.8kPa

Frequency Range: 30-1000MHz (Highest operating frequency <108MHz)

Test Method: ANSI C63.10 (2013)

Setup:
EUT is on a 80cm test bench.
EUT is transmitting at 20kHz.
EUT has a fresh battery installed.
EUT is tested in X, Y and Z axis with the worst case reported.



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02307	Preamp	8447D	1/6/2022	1/6/2024
T2	AN03628	Biconilog Antenna	3142E	6/3/2021	6/3/2023
T3	ANP05360	Cable	RG214	2/4/2022	2/4/2024
T4	ANP06540	Cable	Heliax	1/17/2022	1/17/2024
	AN02673	Spectrum Analyzer	E4446A	3/2/2023	3/2/2025
T5	ANP05333	Cable	Heliax	3/14/2022	3/14/2024

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	776.400M	28.8	-27.7 +1.4	+28.7	+2.2	+0.3	+0.0	33.7	46.0	-12.3	Horiz 130
2	936.668M QP	22.9	-27.3 +1.6	+31.0	+2.4	+0.3	+0.0 360	30.9	46.0	-15.1	Horiz 130
^	936.668M	28.5	-27.3 +1.6	+31.0	+2.4	+0.3	+0.0 360	36.5	46.0	-9.5	Horiz 130
4	590.000M	28.6	-28.1 +1.3	+26.0	+1.9	+0.3	+0.0	30.0	46.0	-16.0	Horiz 130
5	30.980M	28.2	-27.8 +0.4	+20.9	+0.4	+0.1	+0.0 235	22.2	40.0	-17.8	Horiz 130
6	424.000M	28.7	-27.8 +1.1	+23.1	+1.4	+0.2	+0.0	26.7	46.0	-19.3	Horiz 130
7	41.130M	29.0	-27.8 +0.4	+15.3	+0.5	+0.1	+0.0 159	17.5	40.0	-22.5	Horiz 130
8	251.500M	28.8	-27.0 +0.9	+18.2	+1.1	+0.2	+0.0	22.2	46.0	-23.8	Horiz 130
9	52.330M	29.5	-27.8 +0.5	+12.3	+0.5	+0.1	+0.0 48	15.1	40.0	-24.9	Horiz 130
10	75.010M	28.7	-27.8 +0.5	+12.8	+0.5	+0.1	+0.0	14.8	40.0	-25.2	Horiz 130
11	119.000M	29.2	-27.6 +0.7	+13.3	+0.7	+0.1	+0.0	16.4	43.5	-27.1	Horiz 130
12	90.830M	29.3	-27.8 +0.5	+12.8	+0.6	+0.1	+0.0	15.5	43.5	-28.0	Horiz 130

Test Location:	CKC Laboratories, Inc. • 22116 23rd Drive S.E., Suite A • Bothell WA 98021 • 425-402-1717		
Customer:	**Digital Control, Inc.**		
Specification:	**15.209 Radiated Emissions**		
Work Order #:	**108253**	Date:	3/21/2023
Test Type:	**Radiated Scan**	Time:	11:25:15
Tested By:	Steven Pittsford	Sequence#:	1
Software:	EMITest 5.03.20		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

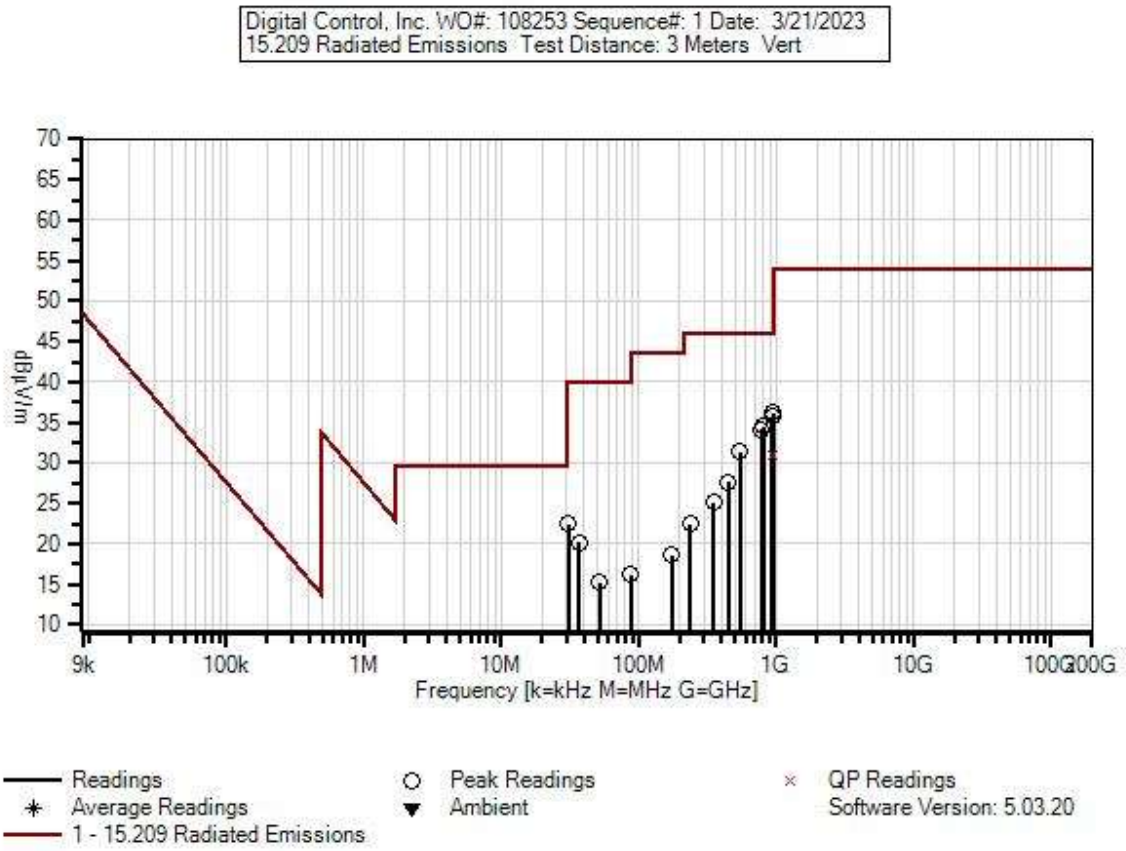
Test Conditions / Notes:

Test Environment Conditions:
Temperature: 22°C
Humidity: 41%
Pressure: 100.8kPa

Frequency Range: 30-1000MHz (Highest operating frequency <108MHz)

Test Method: ANSI C63.10 (2013)

Setup:
EUT is on a 80cm test bench.
EUT is transmitting at 20kHz.
EUT has a fresh battery installed.
EUT is tested in X, Y and Z axis with the worst case reported.



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T3	ANP05360	Cable	RG214	2/4/2022	2/4/2024
T4	ANP06540	Cable	Heliax	1/17/2022	1/17/2024
	AN02673	Spectrum Analyzer	E4446A	3/2/2023	3/2/2025
T5	ANP05333	Cable	Heliax	3/14/2022	3/14/2024

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	958.614M	28.3	-27.2 +1.6	+30.8	+2.4	+0.3	+0.0 360	36.2	46.0	-9.8	Vert 129
2	929.101M	28.1	-27.3 +1.6	+30.6	+2.4	+0.3	+0.0 360	35.7	46.0	-10.3	Vert 129
3	809.581M	28.8	-27.6 +1.5	+29.3	+2.2	+0.3	+0.0 360	34.5	46.0	-11.5	Vert 129
4	787.239M	28.9	-27.7 +1.5	+28.9	+2.2	+0.3	+0.0 360	34.1	46.0	-11.9	Vert 129
5	545.500M	29.5	-28.2 +1.2	+26.9	+1.7	+0.2	+0.0 238	31.3	46.0	-14.7	Vert 99
6	941.897M QP	22.8	-27.3 +1.6	+31.2	+2.4	+0.3	+0.0 360	31.0	46.0	-15.0	Vert 99
^	941.897M	28.3	-27.3 +1.6	+31.2	+2.4	+0.3	+0.0 360	36.5	46.0	-9.5	Vert 129
8	30.770M	28.4	-27.8 +0.4	+21.0	+0.4	+0.1	+0.0	22.5	40.0	-17.5	Vert 99
9	449.500M	29.7	-27.9 +1.1	+23.1	+1.5	+0.2	+0.0 56	27.7	46.0	-18.3	Vert 99
10	37.020M	29.6	-27.8 +0.4	+17.5	+0.4	+0.1	+0.0	20.2	40.0	-19.8	Vert 99
11	349.500M	28.6	-27.2 +1.0	+21.2	+1.3	+0.2	+0.0 360	25.1	46.0	-20.9	Vert 99
12	239.500M	29.5	-27.1 +0.9	+18.0	+1.0	+0.2	+0.0 360	22.5	46.0	-23.5	Vert 99
13	52.380M	29.6	-27.8 +0.5	+12.3	+0.5	+0.1	+0.0	15.2	40.0	-24.8	Vert 99
14	174.500M	28.6	-27.4 +0.7	+15.7	+0.9	+0.1	+0.0	18.6	43.5	-24.9	Vert 99
15	88.240M	30.3	-27.8 +0.5	+12.5	+0.6	+0.1	+0.0	16.2	43.5	-27.3	Vert 99

Test Setup Photo(s)

Test Setup, 80cm

X Axis

Y Axis

Z Axis

SUPPLEMENTAL INFORMATION

Measurement Uncertainty

Uncertainty Value	Parameter
4.73 dB	Radiated Emissions
3.34 dB	Mains Conducted Emissions
3.30 dB	Disturbance Power

Uncertainties reported are worst case for all CKC Laboratories' sites and represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k=2.
Compliance is deemed to occur provided measurements are below the specified limits.

Emissions Test Details

TESTING PARAMETERS

Unless otherwise indicated, the following configuration parameters are used for equipment setup: The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. Cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the setup photographs. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables.

The emissions data was taken with a spectrum analyzer or receiver. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the table below. The corrected data was then compared to the applicable emission limits. Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in dBµV/m, the spectrum analyzer reading in dBµV was corrected by using the following formula. This reading was then compared to the applicable specification limit. Individual measurements were compared with the displayed limit value in the margin column. The margin was calculated based on subtracting the limit value from the corrected measurement value; a positive margin represents a measurement exceeding the limit, while a negative margin represents a measurement less than the limit.

SAMPLE CALCULATIONS		
	Meter reading	(dBµV)
+	Antenna Factor	(dB/m)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dBµV/m)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed were used to collect the emissions data. A spectrum analyzer or receiver was used for all measurements. Unless otherwise specified, the following table shows the measuring equipment bandwidth settings that were used in designated frequency bands. For testing emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used.

MEASURING EQUIPMENT BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	9 kHz	150 kHz	200 Hz
RADIATED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	>1 GHz	1 MHz

SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the emissions tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "positive peak" detector mode. Whenever a "quasi-peak" or "average" reading was recorded, the measurement was annotated with a "QP" or an "Ave" on the appropriate rows of the data sheets. In cases where quasi-peak or average limits were employed and data exists for multiple measurement types for the same frequency then the peak measurement was retained in the report for reference, however the numbering for the affected row was removed and an arrow or caret ("^") was placed in the far left-hand column indicating that the row above takes precedence for comparison to the limit. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the spectrum analyzer or receiver recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature called "peak hold," the measurement device had the ability to measure intermittent or low duty cycle transient emission peak levels. In this mode the measuring device made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

Quasi-peak measurements were taken using the quasi-peak detector when the true peak values exceeded or were within 2 dB of a quasi-peak specification limit. Additional QP measurements may have been taken at the discretion of the operator.

Average

Average measurements were taken using the average detector when the true peak values exceeded or were within 2 dB of an average specification limit. Additional average measurements may have been taken at the discretion of the operator. If the specification or test procedure requires trace averaging, then the averaging was performed using 100 samples or as required by the specification. All other average measurements are performed using video bandwidth averaging. To make these measurements, the test engineer reduces the video bandwidth on the measuring device until the modulation of the signal is filtered out. At this point, the measuring device is set into the linear mode and the scan time is reduced.