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RA-02-33183/02/A/ST

FCC CERTIFICATION
E.M.C. Measurement
Technical Report

standard to apply:
FCC Part 15.209

Equipment under test:
RMP3-433

FCC ID : KQG RMP3-433

Company:
RENISHAW METROLOGY LTD

DISTRIBUTION: Mr WOOLLETT **Company: RENISHAW METROLOGY LTD**

Number of pages: 10

Ed.	Date	Modified pages	Editing Name	Editing Visa	Verification Approval Name	Verification Approval Visa
0	31-May-02	Creation	D. GRATON	DG	P BONNENFANT	

EQUIPMENT UNDER TEST

type: RMP3-433
serial number: U44545

MANUFACTURER: RENISHAW METROLOGY LTD

COORDINATES OF THE COMPANY SUBMITTING THE EQUIPMENT:

Company: RENISHAW METROLOGY LTD

Address: New Mills, Wotton Under Edge
Gloucestershire GL 12 8JR
ENGLAND

Responsible: Mr WOOLLETT

DATE (S) OF THE TEST: 22 and 24 May 2002

LOCALITY OF THE TEST: EMITECH ATLANTIQUE open area test site in LA POUEZE (49) FRANCE

TESTED BY: D. GRATON

CONTENTS

1. INTRODUCTION

This document presents the result of E.M.C. test carried out on the following equipment: RMP3-433 in accordance with normative reference.

2. PRODUCT DESCRIPTION

ITU Emission code: 7K00F7D

Classe: A (paragraph FCC part 15.3)

Utilization: probe for machine tools telemetry, transmitter

Antenna type: internal antenna

Operating frequency range: from 433.075 MHz to 434.775 MHz

No of channels: 69

Channel spacing: 25 kHz

Frequency generation: O SAW Resonator O Crystal ⊙ Synthetiser

Modulation: O Amplitude O Digital ⊙ Frequency O Phase

Frequency deviation: ± 3.5 kHz

Power source: 9 Vdc (battery)

Power level, frequency range and channels characteristics are not user adjustable.

The details pictures of the product and the circuit boards are joined with this file.

3. NORMATIVE REFERENCE

FCC Part 15 (2000) Code of Federal Regulations
Title 47 - Telecommunication
Chapter 1 - Federal Communications Commission
Part 15 - Radio frequency devices
Subpart C - Intentional Radiators

4. TEST METHODOLOGY

Radio performance tests procedures given in part 15:

Paragraph 209: radiated emission limits; general requirements
Paragraph 33: frequency range of radiated measurements
Paragraph 35: measurement detector functions and bandwidths

5. RELATED SUBMITTAL GRANT

The telemetry sensor RMP3-433 is used with the receiver MI16-433 (FCC ID: KQG MI16-433).

6. TEST UNIT CONFIGURATION

JOINED DOCUMENTATIONS

"Synoptic"	*RMP3 433 SYNOPTIC.pdf*
"Block diagram"	*RMP3 433 BREAK DOWN.pdf*
"External photos and Product labeling"	*RMP3 433 EXTERNAL PHOTOS.pdf*
"Assembly of components"	*RMP3 433 CAB.pdf*
"Internal photos"	*RMP3 433 INTERNAL PHOTOS.pdf*
"Layout pcb"	*RMP3 433 LAYOUT.pdf*
"Bil of materials"	*RMP3 433 PART LIST.pdf*
"Schematics"	*RMP3 433 SCHEMATIC.pdf*
"Product description"	*RMP3 433 TECHNICAL SPEC.pdf*
"User guide"	*RMP3 433 USER GUIDE.pdf*

7. TESTS AND CONCLUSIONS

Test procedure	Description of test	Criteria respected ?				Comment
		Yes	No	NAp	NAs	
FCC Part 15.209	RADIATED EMISSION LIMITS; general requirements	X				

NAp: Not Applicable NAs: Not Asked

Conclusion:

The sample of RMP3-433 submitted to the tests complies with the regulations of the standard FCC Part 15 in accordance with the limits or criteria defined in this report.

8. RADIATED EMISSION LIMITS; GENERAL REQUIREMENTS

Standard: FCC Part 15 (2000)

Test procedure: paragraph 209

Test equipment:

TYPE	BRAND	REFERENCE
Test receiver	Rohde & Schwarz ESVS 10	1/02/12/049
Biconical antenna	Hewlet Packard 11966 C	3/24/18/117
Log periodic antenna	Rohde & Schwarz HL 223	3/24/18/194
Double ridged guide antenna	Electrometrics EM 6961	3/24/18/201
Spectrum analyser	Rohde & Schwarz FSEM30	1/02/12/050
Open area test site	EMITECH	3/16/12/016
Preamplifier	DBS Microwave DB97-1852	3/01/12/076
High pass filter	Micro-tronics HPM11630	3/18/12/146

Test set up:

The system is tested in an open area test site (OATS).
The test unit is placed on a rotating table, 1.5 m from a ground plane. Zero degree azimuth corresponds to the front of the equipment under test.

Frequency range: from 9 kHz to harmonic 10 ($F_{carrier} \leq 1$ GHz)

Detection mode: Quasi-peak (F < 1 GHz)
Average (F > 1 GHz)

Bandwidth: 120 kHz (F < 1 GHz)
1 MHz (F > 1 GHz)

Distance of antenna: 3 meters

Antenna height: 1 to 4 meters

Antenna polarization: vertical and horizontal

Equipment under test operating condition:

The equipment is in continuous transmission mode.

Results:

Ambient temperature (°C):	17	16
Relative humidity (%):	72	74

Power source: 9 V

The polarity column refers to the antenna polarity at which the maximum emissions level is measured.

Lowest Channel *Emission*

FREQUENCIES (MHz)	Position of the transmitter	Antenna height (cm)	Polarization H: Horizontal V: Vertical	Azimuth (degrees)	Field strength (dBµV/m)	Limits (dBµV/m)
433.075	Vertical	107	H	180	45.95	46.02
1732.3	Horizontal	104	V	0	25.52	53.98
2165.37	Horizontal	105	H	200	41.96	53.98
3031.53	Horizontal	215	H	0	26.06	53.98
4330.75	Horizontal	192	H	150	29.39	53.98

Highest Channel *Emission*

FREQUENCIES (MHz)	Position of the transmitter	Antenna height (cm)	Polarization H: Horizontal V: Vertical	Azimuth (degrees)	Field strength (dBµV/m)	Limits (dBµV/m)
434.775	Vertical	107	H	180	45.95	46.02
1739.1	Horizontal	120	V	0	27.96	53.98
2173.87	Horizontal	106	H	200	40.96	53.98
3043.42	Horizontal	184	H	120	28.06	53.98
4347.75	Horizontal	192	H	140	32.7	53.98

Vertical: upright
Horizontal: to put flat

9. PHOTOGRAPHIES OF THE EQUIPMENT UNDER TEST

General view

Photography open area test site: weather protection enclosure