

# **Coda cx1 EMI/EMC Test Procedure**

CDL 1-TP07-0400:0209  
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# **1. Introduction**

## **1.1 Activity Description**

This document is intended to specify the requirements for Electromagnetic Interference (EMI) and Electromagnetic Compatibility (EMC) testing. The tests are to be performed on the Coda cx1 sensor unit, 8-marker drive boxes and markers to demonstrate EMC compliance in accordance with the collateral standard for Medical Electrical Equipment EN60601-1-2.

EMC is concerned with the protection of the radio spectrum and requires that electrical and electronic products made or sold in the United Kingdom be constructed so that they do not cause excessive electromagnetic interference and are not unduly affected by electromagnetic interference.

On completion of an EC Declaration of Conformity under the EMC Regulations that states that the apparatus conforms with the protection requirements of the EMC Directive (89/336/EEC), the apparatus may carry CE marking.

## **2. Requirements**

### **2.1 Context**

This procedure is supported by the activities contained in the Short Form Functional Test Procedure (CDL 1-TP07-0100:0208) and the Long Form Functional Test Procedure (CDL 1-TP07-0500:0211).

### **2.2 List of Hardware Under Test**

Coda cx1 sensor unit  
Externally powered 8-marker drive box  
8 markers

### **2.3 List of Support Hardware Items**

Internally powered 8-marker drive box complete with 1 marker  
Mini hub adapted for current and voltage monitoring  
Host PC with RS-422 serial card  
Power supply for marker drive boxes  
Coda interface cable  
Serial cable  
Digital multi-meter  
Marker disc

### **2.4 List of Software Requirements**

Coda Motion Analysis Software V6.56  
Coda cx1 calibration files  
Coda cx1 configuration file

SHARC DSP system file V3.02

## **2.5 List of Additional Documentation**

2 Copies of the Coda cx1 Short Form Functional Test Procedure (CDL 1-TP07-0100:0208)

2 Copies of the Coda cx1 Long Form Functional Test Procedure (CDL 1-TP07-0500:0211)

### **3. Configuration**

#### **3.1 General Constraints**

Electrostatic discharge (ESD) protection procedures per MIT 99-01003 shall be observed.

Connector mating/demating procedures per MIT 99-03002 shall be observed. Except that a mate/demate log will not be required.

#### **3.2 Test Configuration**

The tests are to be conducted with items configured as described in CDL 1-TM07-0300:0211.

#### **3.3 Test Specification**

The Coda cx1 system is to be tested in accordance with the collateral standard for Medical Electrical Equipment EN60601-1-2. This standard covers both emissions and immunity and includes the following:

- Electrostatic Discharge – EN61000-4-2
- Radiated RF Fields – EN61000-4-3
- Electrical Fast Transients/Bursts – EN61000-4-4
- Voltage Surges – EN61000-4-5
- Conducted RF Fields – EN61000-4-6
- Radiated Magnetic Fields – EN61000-4-8
- Power Frequency Magnetic Fields – EN61000-4-8
- Voltage Dips and Interruptions – EN61000-4-11
- Mains Voltage Harmonics – EN61000-3-2
- Mains Fluctuations and Flicker – EN61000-3-3
- Conducted and Radiated Emissions – EN55011

## 4. Procedures

Administrative information for this test is to be recorded in the space provided in Section 4.1. In addition, the test conductor may annotate the procedures to more accurately document the course of the test whether routine or anomalous. The following pages, plus test data generated by the host PC, will be attached to the test report which is completed every time this test is conducted. The test conductor is assumed to have reasonable familiarity and competence in navigating through software applications which observe standard Windows conventions.

### 4.1 Identification of Equipment and Personnel

Coda cx1 sensor unit	_____
8 Coda markers	_____
Coda externally powered 8-marker drive box	_____
Test Conductor	_____
Test Date	_____
Test Location	_____
QA Representative	_____
Other individuals	_____

## 4.2 Long Form Functional Test (Pre-EMI/EMC)

Perform the Coda cx1 Long Form Functional Test (CDL 1-TP07-0500:0211), and attach the completed document to this report.

Pass	Fail	Time	Initial

## 4.3 EMI/EMC Tests

### 4.3.1 Test Configuration and System Set-up

Configure the test hardware as shown in CDL 1-TM07-0300:0211. Attach a single marker to the marker 1 socket of an internally powered 8-marker drive box and secure to the marker disc. Launch and configure the software as described in Section 4.3.4 of the Short Form Functional Test Procedure (CDL 1-TP07-0100:0208) but on this occasion select the setup file:

*EMC.stp*

From the *Coda* menu select **Display Marker Positions**. A dialog box will appear showing the position of marker 1. Ensure the Coda system remains in this state while the Medical Electrical Equipment (EN60601-1-2) tests are being conducted.

### 4.3.2 Medical Electrical Equipment (EN60601-1-2) Tests

Conduct the following tests covered by the EN60601-1-2 standard and attach performance plots for each case to this report.

Electrostatic Discharge – EN61000-4-2

Pass	Fail	Time	Initial

Radiated RF Fields – EN61000-4-3

Pass	Fail	Time	Initial

Electrical Fast Transients/Bursts – EN61000-4-4

Pass	Fail	Time	Initial

Voltage Surges – EN61000-4-5

Pass	Fail	Time	Initial

Conducted RF Fields – EN61000-4-6

Pass	Fail	Time	Initial

Radiated Magnetic Fields – EN61000-4-8

Pass	Fail	Time	Initial

Power Frequency Magnetic Fields – EN61000-4-8

Pass	Fail	Time	Initial

Voltage Dips and Interruptions – EN61000-4-11

Pass	Fail	Time	Initial

Mains Voltage Harmonics – EN61000-3-2

Pass	Fail	Time	Initial

Mains Fluctuations and Flicker – EN61000-3-3

Pass	Fail	Time	Initial

Conducted and Radiated Emissions – EN55011

Pass	Fail	Time	Initial

#### 4.4 Long Form Functional Test (Post-EMI/EMC)

Perform the Coda cx1 Long Form Functional Test (CDL 1-TP07-0500:0211), and attach the completed document to this report.

Pass	Fail	Time	Initial



## **5. Test Operator Information**

### **5.1 In the Event of Test Failure**

Problems are covered in a similar section of the Short Form Test Procedure so are not repeated here.