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TEST REPORT NO.: 416478-99-01-R18-0852

DAYTON T. BROWN, INC. JOB NO.: 416478

CUSTOMER: SECURAM SYSTEMS, INC.
3325 GRANDE VISTA DRIVE
NEWBURY PARK, CA 91320

SUBJECT: ELECTROMAGNETIC SUSCEPTIBILITY TEST PROGRAM PERFORMED ON
THREE SAFE LOCKS AND TWO DOOR LOCKS

PURCHASE ORDER NO.: 180801V01

THIS REPORT CONTAINS: 42 PAGES

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DATE:	SEPTEMBER 6, 2018

INFORMATION CONTAINED HEREIN MAY BE SUBJECT TO EXPORT CONTROL LAWS. REFER TO INTERNATIONAL TRAFFIC IN ARMS REGULATION (ITAR) OR THE EXPORT ADMINISTRATION REGULATION (EAR) OF 1979. IT IS THE RESPONSIBILITY OF THE RECIPIENT TO OBTAIN ANY REQUIRED LICENSES TO EXPORT ANY CONTROLLED DATA.

THE DATA CONTAINED IN THIS REPORT WAS OBTAINED BY TESTING IN
COMPLIANCE WITH THE APPLICABLE TEST SPECIFICATION AS NOTED

Revision History

Table 1 - Revision History

Revision	Date	Section Affected	Change
-	09/06/18	Original Release	-

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1.0 Abstract

This report details the results of the electromagnetic susceptibility test program on the three Safe Locks and two Door Locks. Testing was performed in accordance with Paragraph 2.0 and was performed at Dayton T. Brown, Inc., Bohemia, New York.

The Safe Locks and Door Locks, hereafter are referred to as EUT (Equipment Under Test).

The EUT components are as follows:

Table 2 - EUT Components

EUT	Component	Part No.	Model No.	Serial No.
1	Backlit	EC-0601A-BL	Not applicable	1808020001039
	Swing Bolt	EL-0601	Not applicable	1808020001035
2	Toplit	EC-0601A-PL	Not applicable	1808020001028
	Swing Bolt	EL-0601-E	Not applicable	1808020001034
3	Prologic	EC-0601A-L01	Not applicable	1808020001036
	Swing Bolt	EL-0601	Not applicable	1808020001025
4	V8 Door Lock	SH-LNV01	Not applicable	1808020001042
5	Card Lock	Not applicable	Not applicable	DTB-1

Pre and post-test inspections revealed no external physical damage.

1.1 Test Summary

Table 3 lists the tests performed and the corresponding test results:

Table 3 - Test Summary

Test	Test Description	Limit	Met the Spec. Requirements	
			Yes	No
RS105	Radiated Susceptibility, Transient Electromagnetic Field	Figure RS105-1, 50,000 V/m	X	

The test results recorded in this report relate only to those items tested.

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2.0 References

- a) MIL-STD-461G, Requirements for the Control of Electromagnetic Interference Characteristics of Subsystems and Equipment, 11 December 2015.
- b) DI-EMCS-80200C, Data Item Description, Electromagnetic Interference Test Report (EMITR), 30 November 2007.

3.0 Acronyms and Abbreviations

The following acronyms and abbreviations may be used throughout this document:

Table 4 - Acronyms and Abbreviations

Acronym/ Abbreviation	Description	Acronym/ Abbreviation	Description
A	Amperes	HERF	Hazards of Electromagnetic Radiation to Fuel
AC	Alternating Current	HERO	Hazards of Electromagnetic Radiation to Ordnance
AF	Audio Frequency	HERP	Hazards of Electromagnetic Radiation to Personnel
Amp	Amplifier	HIRF	High Intensity Radiated Fields
Amps	Amperes	HPM	High Power Microwave
ASW	Anti-submarine Warfare	Hz	Hertz
BIT	Built in Test	ISM	Industrial, Scientific and Medical
BW	Bandwidth	ISO	International Organization for Standardization
CI	Commercial Item	k	Kilo
dB	Decibels	LISN	Line Impedance Stabilization Network
DC	Direct Current	M	Mega
DoD or DOD	Department of Defense	m	milli
DRG	Double Ridge Guide	m	Meter
DTB	Dayton T. Brown, Inc.	μ	micro
E3 or E ³	Electromagnetic Environmental Effects	NDI	Non-Developmental Item
E-Field	Electric Field	n	nano
ELF	Extremely Low Frequency	Ω	Ohm
EMC	Electromagnetic Compatibility	p	pico
EMCON	Emission Control	P-Static	Precipitation Static
EME	Electromagnetic Environment	PRF	Pulse Repetition Frequency
EMF	Electromotive Force	PWM	Pulse Width Modulation
EMI	Electromagnetic Interference	RBW	Resolution Bandwidth
EMICP	Electromagnetic Interference Control Procedure	RF	Radio Frequency
EMITP	Electromagnetic Interference Test Procedure	rms	Root-mean-square
EMITR	Electromagnetic Interference Test Report	T	Tesla
EMP	Electromagnetic Pulse	TEM	Transverse Electromagnetic
ERP	Effective Radiated Power	TPD	Terminal Protection Device
ESD	Electrostatic Discharge	UHF	Ultra High Frequency
EUT	Equipment Under Test	UUT	Unit Under Test
F	Farad	V	Volts
FCC	Federal Communication Commission	VHF	Very High Frequency
G	Giga	VBW	Video Bandwidth
H	Henries	VLF	Very Low Frequency
H-field	Magnetic Field	W	Watts
GFE	Government Furnished Equipment		

4.0 Administrative Information

Table 5 - Administrative Information

a)	EUT Quantity Received:	3 Safe Locks and 2 Door Locks
b)	Date EUT Received:	Hand carried by customer August 15, 2018
c)	Date(s) Tested:	August 14, 2018 through August 15, 2018
d)	Date EUT Shipped:	Hand carried by customer August 15, 2018
e)	Customer Representative(s) Present During All or Part of the Testing:	
	Name	Affiliation
	Jeremy Brookes	SecuRam Systems, Inc.
	Saveta Persaud	SecuRam Systems, Inc.

5.0 Test Sample Information

5.1 Modifications

No modifications were made to the EUT during the course of this testing program.

6.0 Test Sample Operation

6.1 Mode of Operation

All testing was performed with the EUT operating as follows:

- Operational: Safe lock assembly in the locked position installed on the safe
- Operational: Door lock assembly in the locked position in free space

6.2 Susceptibility Criteria

During susceptibility testing, operation of the EUT was monitored by the customer representative and DTB technician for the following:

- Any indication of malfunction or degradation of operation.
- Lock mechanism to function properly after X, Y and Z positions were tested with 50 kV pulse.

7.0 General Test Information

7.1 Test Facility

All testing was performed at Dayton T. Brown, Inc., Bohemia, New York.

7.2 Setup

The EUT (Safe Lock) was mounted in a safe in accordance with Figure 4 of MIL-STD-461G. The safe was placed on 5 cm foam that sat on the ground plane of the shielded enclosure floor.

The EUT (Door Lock) was placed on a non-conductive bench in accordance with Figure 3 of MIL-STD-461G. The non-conductive bench sat on the ground plane of the shielded enclosure floor.

Photograph(s) of the test setups are included in each test method.

8.0 Test Instrumentation

8.1 Tolerances

With any testing method there will be parameter variations due to the nature of testing. These parameter variations are controlled to be within a suitable range of the requirements of the specification. If no tolerances are given from the specification or customer procedure, any required parameter will have a tolerance of +/-20%.

8.2 Instrumentation Characteristics

Measurements are made using test equipment with performance monitored and, whenever possible, calibrated by the Dayton T. Brown, Inc. Metrology Department. The calibration system is set up to meet the applicable requirements stipulated in ISO/IEC 17025, ISO 9001, ANSI/NCSL Z540.1-1994 (R2002), and ISO10012. All measuring instruments are calibrated with traceability to intrinsic, International, or National Standards such as NIST (National Institute of Standards and Technology) at periodic intervals. Details are on file at Dayton T. Brown, Inc., and will be made available upon request.

9.0 Test Methods

9.1 Radiated Susceptibility, Method RS105, Transient Electromagnetic Field

9.1.1 Purpose

The purpose of this test is to verify the ability of the EUT to withstand transient electromagnetic fields.

9.1.2 Limit

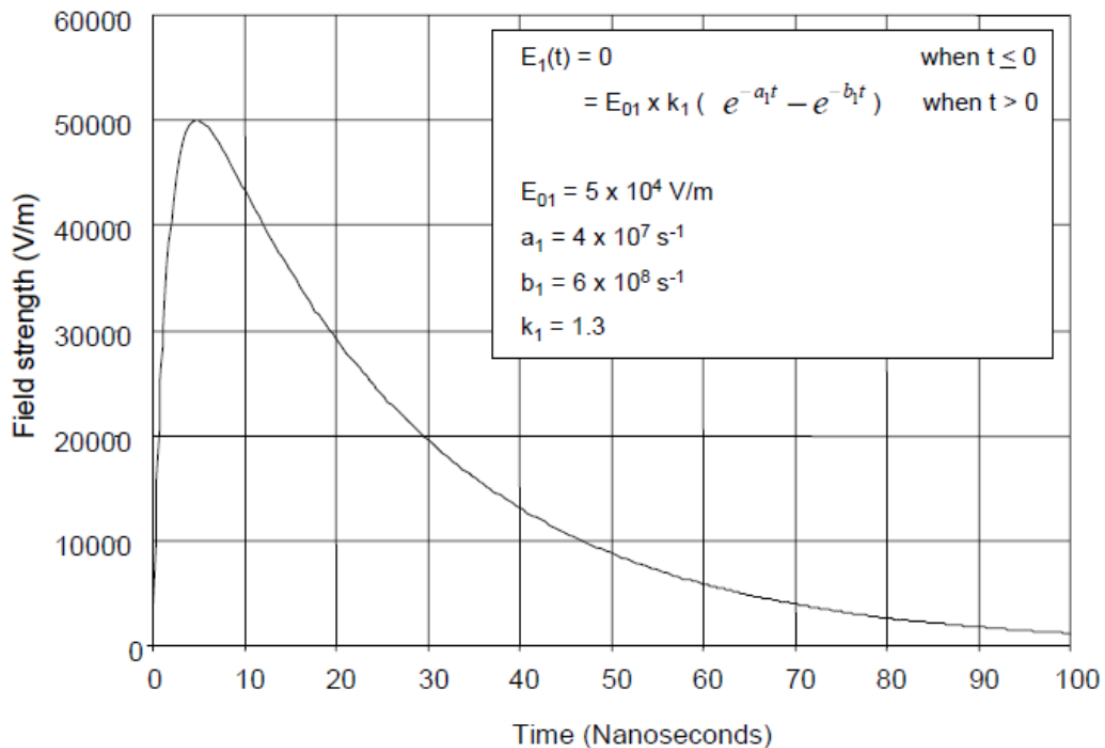


Figure 1 - RS105, Required Limit

9.1.3 Equipment List

Table 6 - RS105, Equipment List

ITEM	MANUFACTURER	MODEL	DTB NO.	CAL DUE DATE
EMP SIMULATOR SYSTEM	FCC	RS105	01E-043	No Cal Required
FACILITY, RS105	DAYTON T. BROWN	RS105 FACILITY	01E-061	No Cal Required
OSCILLOSCOPE, DIGITAL 4 CHANNEL 500MHZ	TEKTRONIX	TDS 3054B	21-121	08/19/2018
SENSOR, MAGNETIC FIELD	FCC	HFP-1000A	27-384	06/09/2019

9.1.4 Test Setup

The test setup is as detailed in Paragraph 7.2 of this document.

Prior to setting up EUT for testing, the uniform field area of the RS105 test setup was verified to be 1 meter by 1 meter by 1 meter minimum.

The EUT was placed within the working volume of the RS105 antenna array in such a manner that it does not exceed the usable volume of the radiation system ($h/3$, $B/2$, $A/2$)/(x,y,z) as shown in Figure RS105-3 of MIL-STD-461G (h is the maximum vertical separation of the plates). The test sample was located below the RS105 antenna, in the center of the uniform field area. A magnetic field sensor was used to measure the field.

The EUT was supported by dielectric material that produces a minimum distortion of the EM fields.

The test setup employed was as detailed in the test setup photograph(s).

9.1.5 Calibration

Before the EUT was installed in the test setup, the field strength of the RS105 setup was verified.

The magnetic field sensor was placed in the center position of the five-point grid in the vertical plane where the front face of the EUT will be located.

Using the magnetic field sensor, it was verified that the pulsed field produced met the peak amplitude, rise time, and pulse width.

For 50,000 V/m the required magnetic field was 132.63 A/m.

$$\text{Electric Field Strength} = \text{Magnetic Field Strength} \times \text{Impedance of Air}$$

Where:

Electric Field Strength (Target = 50,000 V/m)

Magnetic Field Strength Measured with sensor (Target = 132.63 A/m)

Impedance of Air = 377 Ohms

The pulse waveform was recorded on the oscilloscope.

The pulse generator settings and associated pulse drive amplitude were determined to satisfy the field requirements.

This process was repeated at each of the other four points of the grid.

The peak value of the electric or magnetic field for each grid position was verified to be 0 dB < magnitude < 6 dB above limit.

The calibration setup is illustrated in Figure 2.

9.1.6 Test Procedure

The pulse was applied at the calibrated generator setting to ensure that the drive pulse waveform characteristics were consistent with those noted during calibration.

At least 5 pulses at a rate of not more than one pulse per minute were applied.

The EUT was monitored during and after each pulse for signs of susceptibility or degradation of performance.

The EUT was tested in three orthogonal orientations.

9.1.7 Test Results

No change in indication, malfunction, or degradation in the EUT operation was observed.

Operation of the EUT was performed by the customer representative and visually verified by DTB technician prior to testing. After subjecting the EUT to the electromagnetic pulse of each orientation, operation of the EUT was performed by the customer representative and function of the lock mechanism to be able to open and close properly was visually verified by DTB technician.

See the following test data for detailed test results.

9.1.7.1 RS105, Calibration Data

Test Item: (3) Safe Locks and (2) Door Locks
 Customer: SecuRam Systems, Inc.
 Test Mode: Calibration
 Specification: MIL-STD-461G
 Procedure: MIL-STD-461G

Date: 8-14-18
 Job No.: 416478
 Amplitude: 50 kV/m
 Technician: P. Kelly

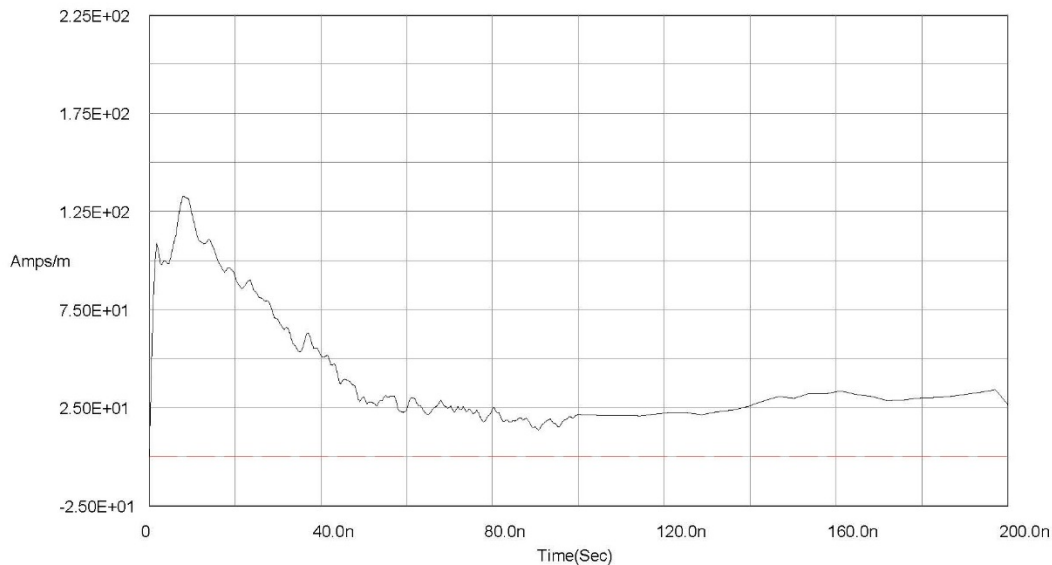
Radiated Susceptibility, Method RS105, Transient Electromagnetic Field

RS-105 Simulator H-Field Calibration

8/14/2018 2:54:14 PM

Test Point: CAL CENTER
 Test Date: 08-14-2018 14:53:36
 Test Type: Time Domain Acquisition
 Facility: Dayton T Brown
 Sig Probe: H-FP1000A(01-23-2009)(09-04)
 Time Max: 2.00E-07 Sec
 Min: 0.00E+00 Sec
 Amp Max: 1.33E+02 Amps/m
 Min: 0.00E+00 Amps/m

Description :



Required A/m: 132.6
 Required V/m: 50,000
 Measured Ip: 133
 Measured Vp: 50,141

Power Supply Setting, kV: 39 kV

Remarks: Measured V/m = Measured A/m x 377

Test Item: (3) Safe Locks and (2) Door Locks
Customer: SecuRam Systems, Inc.
Test Mode: Calibration
Specification: MIL-STD-461G
Procedure: MIL-STD-461G

Date: 8-14-18
Job No.: 416478
Amplitude: 50 kV/m
Technician: P. Kelly

Radiated Susceptibility, Method RS105, Transient Electromagnetic Field

Required A/m: 132.6 Measured Ip: 133
 Required V/m: 50,000 Measured Vp: 50,141

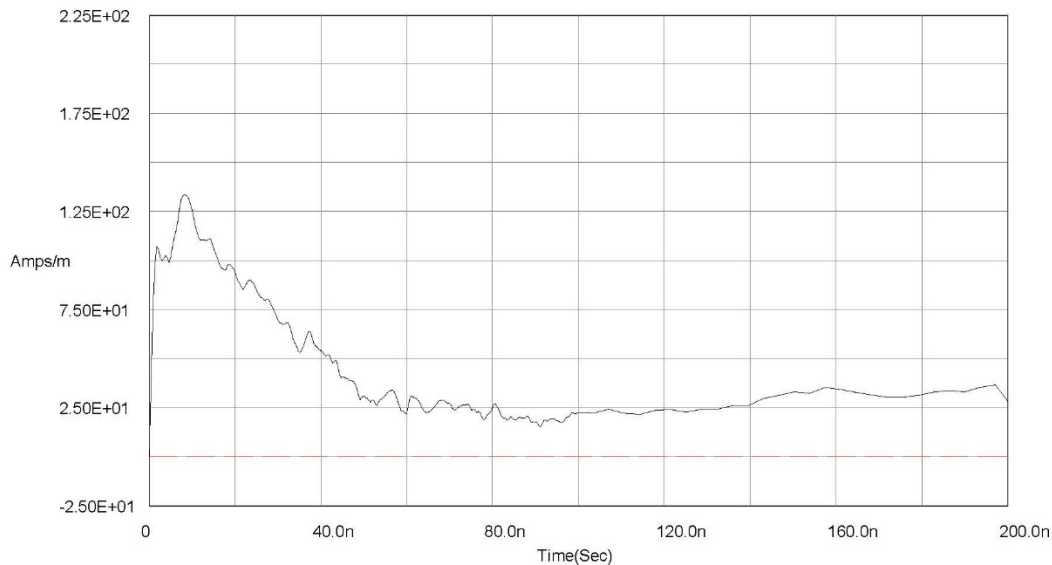
Power Supply Setting, kV: 39 kV

RS-105 Simulator H-Field Calibration

8/14/2018 3:02:31 PM

Test Point: CAL FRONT LEFT 6 Time Max: 2.00E-07 Sec
 Test Date: 08-14-2018 15:01:51 Min: 0.00E+00 Sec
 Test Type: Time Domain Acquisition Amp Max: 1.33E+02 Amps/m
 Facility: Dayton T Brown Min: 0.00E+00 Amps/m
 Sig Probe: H-FP1000A(01-23-2009)(09-04)

Description :



Remarks: Measured V/m = Measured A/m x 377

Test Item: (3) Safe Locks and (2) Door Locks
Customer: SecuRam Systems, Inc.
Test Mode: Calibration
Specification: MIL-STD-461G
Procedure: MIL-STD-461G

Date: 8-14-18
Job No.: 416478
Amplitude: 50 kV/m
Technician: P. Kelly

Radiated Susceptibility, Method RS105, Transient Electromagnetic Field

Required A/m: 132.6 Measured Ip: 133
 Required V/m: 50,000 Measured Vp: 50,141

Power Supply Setting, kV: 39 kV

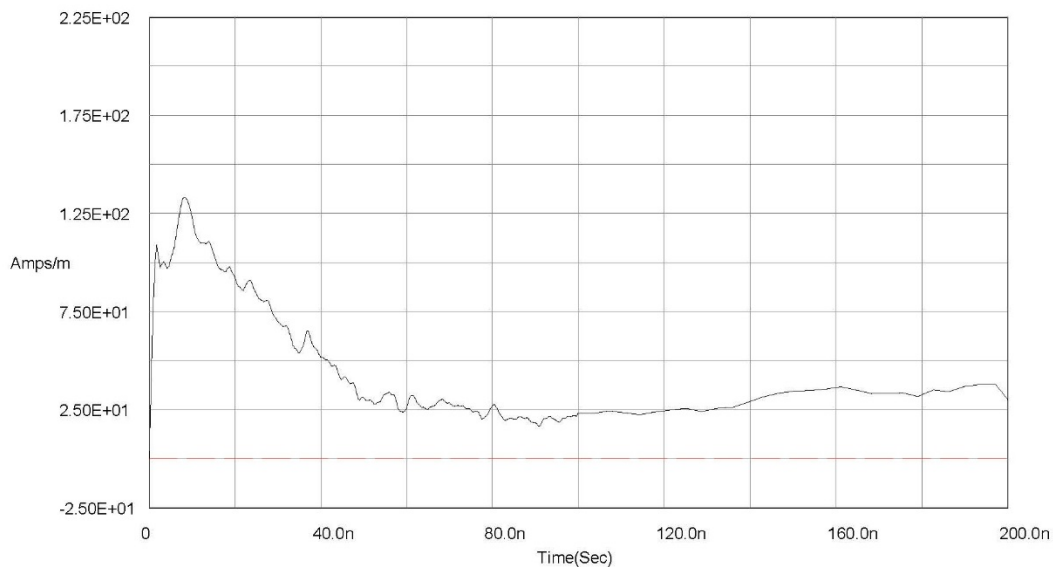
RS-105 Simulator H-Field Calibration

8/14/2018 2:51:47 PM

Test Point: CAL LEFT REAR4
 Test Date: 08-14-2018 14:50:59
 Test Type: Time Domain Acquisition
 Facility: Dayton T Brown
 Sig Probe: H-FP1000A(01-23-2009)(09-04)

Time Max: 2.00E-07 Sec
 Min: 0.00E+00 Sec
 Amp Max: 1.33E+02 Amps/m
 Min: 0.00E+00 Amps/m

Description :



Remarks: Measured V/m = Measured A/m x 377

Test Item: (3) Safe Locks and (2) Door Locks
 Customer: SecuRam Systems, Inc.
 Test Mode: Calibration
 Specification: MIL-STD-461G
 Procedure: MIL-STD-461G

Date: 8-14-18
 Job No.: 416478
 Amplitude: 50 kV/m
 Technician: P. Kelly

Radiated Susceptibility, Method RS105, Transient Electromagnetic Field

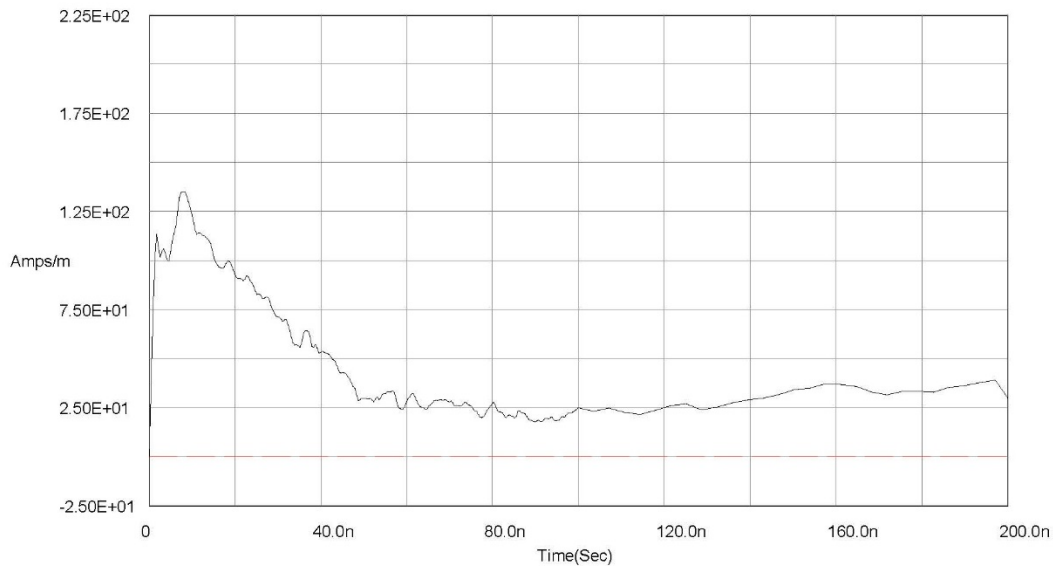
RS-105 Simulator H-Field Calibration

8/14/2018 2:39:58 PM

Test Point: CAL FRONT RIGHT-1
 Test Date: 08-14-2018 14:37:20
 Test Type: Time Domain Acquisition
 Facility: Dayton T Brown
 Sig Probe: H-FP1000A(01-23-2009)(09-04)

Time Max: 2.00E-07 Sec
 Min: 0.00E+00 Sec
 Amp Max: 1.35E+02 Amps/m
 Min: 0.00E+00 Amps/m

Description :



Required A/m: 132.6
 Required V/m: 50,000

Measured Ip: 135
 Measured Vp: 50,895

Power Supply Setting, kV: 39 kV

Remarks: Measured V/m = Measured A/m x 377

Test Item: (3) Safe Locks and (2) Door Locks
 Customer: SecuRam Systems, Inc.
 Test Mode: Calibration
 Specification: MIL-STD-461G
 Procedure: MIL-STD-461G

Date: 8-14-18
 Job No.: 416478
 Amplitude: 50 kV/m
 Technician: P. Kelly

Radiated Susceptibility, Method RS105, Transient Electromagnetic Field

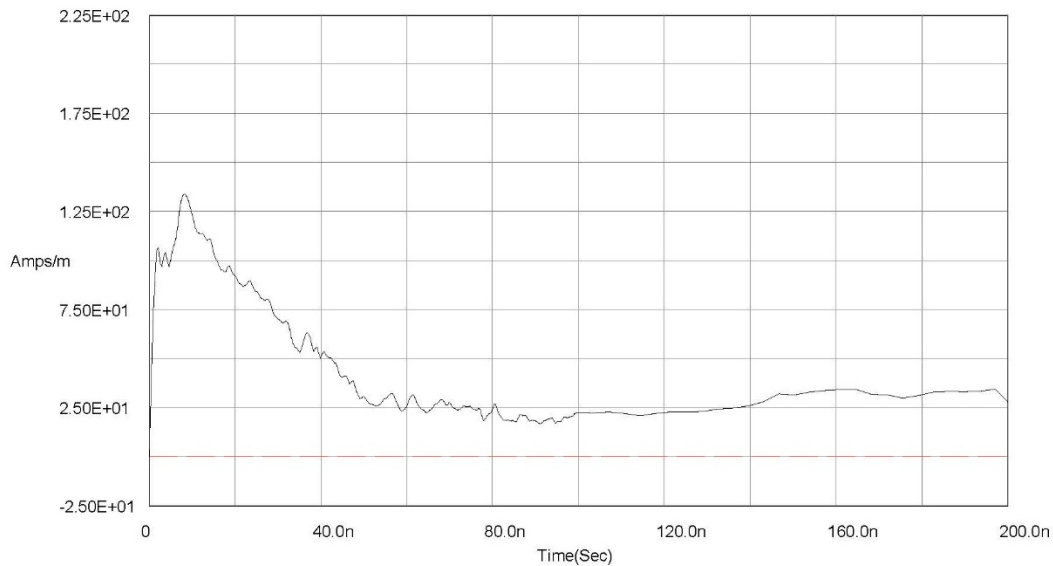
RS-105 Simulator H-Field Calibration

8/14/2018 2:43:50 PM

Test Point: CAL RIGHT REAR
 Test Date: 08-14-2018 14:43:05
 Test Type: Time Domain Acquisition
 Facility: Dayton T Brown
 Sig Probe: H-FP1000A(01-23-2009)(09-04)

Time Max: 2.00E-07 Sec
 Min: 0.00E+00 Sec
 Amp Max: 1.34E+02 Amps/m
 Min: 0.00E+00 Amps/m

Description :



Required A/m: 132.6
 Required V/m: 50,000

Measured Ip: 134
 Measured Vp: 50,518

Power Supply Setting, kV: 39 kV

Remarks: Measured V/m = Measured A/m x 377

9.1.7.2 RS105, Test Data

Test Item:	Backlit / Swing Bolt	Date:	8-15-18
Customer:	SecuRam Systems, Inc.	Serial No.:	See Table 2
Test Mode:	Operational	Job No.:	416478
Specification:	MIL-STD-461G	Technician:	P. Kelly
Procedure:	MIL-STD-461G		

Radiated Susceptibility, Method RS105, Transient Electromagnetic Field

Met Requirement

Yes ☒ No ☐

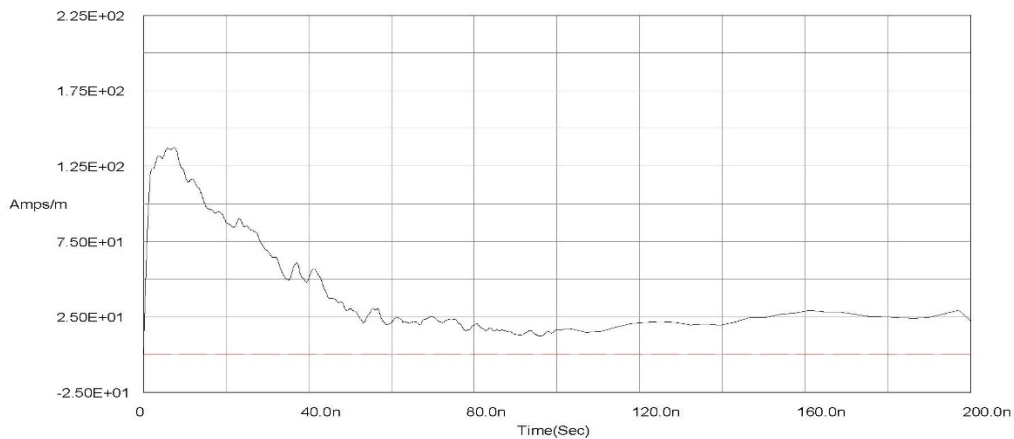
Applied Level (V/m)	Number of Pulses	Pulse Rate	Susceptibility Threshold Level (V/m)	Observation
50kV	5	1 Pulse per minute X-Axis	N/A	EUT functioned properly after application of the pulses.
50kV	5	1 Pulse per minute Y-Axis	N/A	EUT functioned properly after application of the pulses.
50kV	5	1 Pulse per minute Z-Axis	N/A	EUT functioned properly after application of the pulses.

RS-105 Simulator H-Field Calibration

8/15/2018 10:19:01 AM

Test Point: X AXIS BACKLIT SWING BOLT
 Test Date: 08-15-2018 10:17:55
 Test Type: Time Domain Acquisition
 Facility: Dayton T Brown
 Sig Probe: H-FP1000A(01-23-2009)(09-04)
 Time Max: 2.00E-07 Sec
 Min: 0.00E+00 Sec
 Amp Max: 1.38E+02 Amps/m
 Min: 0.00E+00 Amps/m

Description :



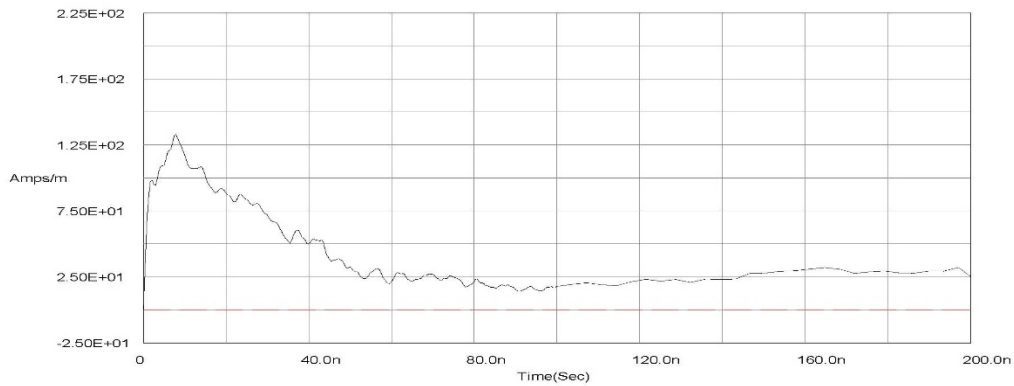
RS-105 Simulator H-Field Calibration

8/15/2018 10:40:39 AM

Test Point: Y AXIS BACKLIT SWING
 Test Date: 08-15-2018 10:39:38
 Test Type: Time Domain Acquisition
 Facility: Dayton T Brown
 Sig Probe: H-FP1000A(01-23-2009)(09-04)

Time Max: 2.00E-07 Sec
 Min: 0.00E+00 Sec
 Amp Max: 1.33E+02 Amps/m
 Min: 0.00E+00 Amps/m

Description :



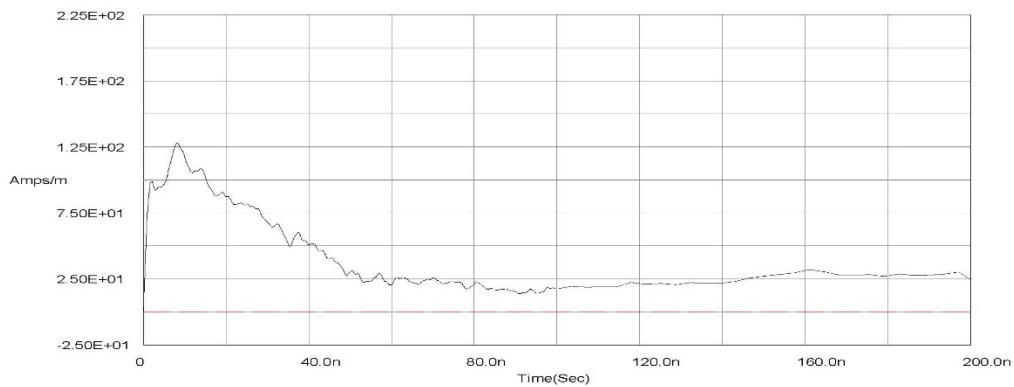
RS-105 Simulator H-Field Calibration

8/15/2018 10:50:44 AM

Test Point: Z AXIS BACKLIT SWING
 Test Date: 08-15-2018 10:49:39
 Test Type: Time Domain Acquisition
 Facility: Dayton T Brown
 Sig Probe: H-FP1000A(01-23-2009)(09-04)

Time Max: 2.00E-07 Sec
 Min: 0.00E+00 Sec
 Amp Max: 1.28E+02 Amps/m
 Min: 0.00E+00 Amps/m

Description :



Test Item: Toplit / Swing Bolt
Customer: SecuRam Systems, Inc.
Test Mode: Operational
Specification: MIL-STD-461G
Procedure: MIL-STD-461G

Date: 8-15-18
Serial No.: See Table 2
Job No.: 416478
Technician: P. Kelly

Radiated Susceptibility, Method RS105, Transient Electromagnetic Field

Met Requirement

Yes ☒ No ☐

Applied Level (V/m)	Number of Pulses	Pulse Rate	Susceptibility Threshold Level (V/m)	Observation
50kV	5	1 Pulse per minute X-Axis	N/A	EUT functioned properly after application of the pulses.
50kV	5	1 Pulse per minute Y-Axis	N/A	EUT functioned properly after application of the pulses.
50kV	5	1 Pulse per minute Z-Axis	N/A	EUT functioned properly after application of the pulses.

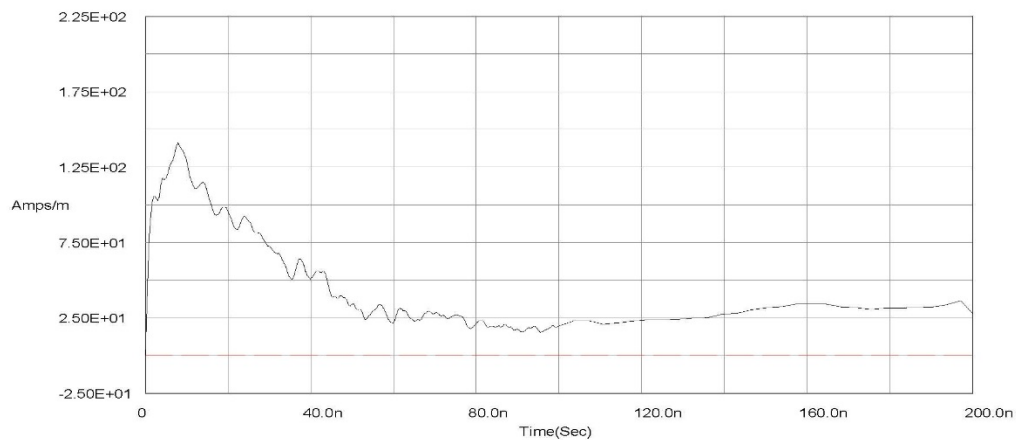
RS-105 Simulator H-Field Calibration

8/15/2018 12:38:24 PM

Test Point: X AXIS TOPLIT SWING BOLT
 Test Date: 08-15-2018 12:37:10
 Test Type: Time Domain Acquisition
 Facility: Dayton T Brown
 Sig Probe: H-FP1000A(01-23-2009)(09-04)

Time Max: 2.00E-07 Sec
 Min: 0.00E+00 Sec
 Amp Max: 1.41E+02 Amps/m
 Min: 0.00E+00 Amps/m

Description :



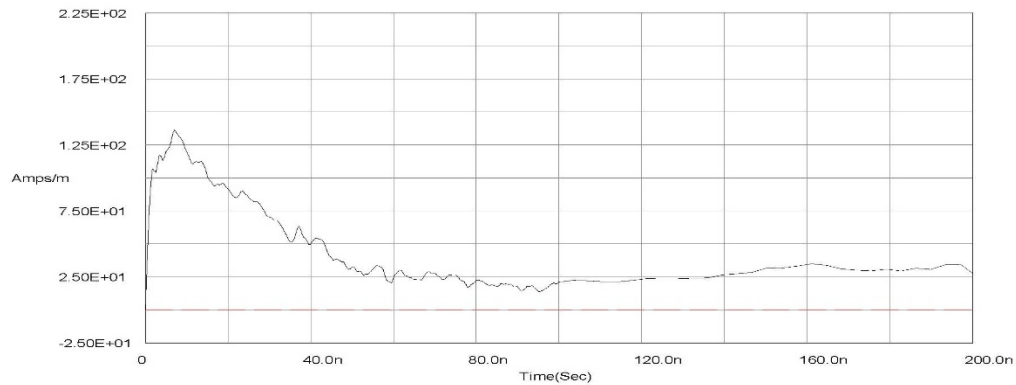
RS-105 Simulator H-Field Calibration

8/15/2018 12:51:49 PM

Test Point: Y AXIS TOPLIT SWING BOLT
 Test Date: 08-15-2018 12:50:16
 Test Type: Time Domain Acquisition
 Facility: Dayton T Brown
 Sig Probe: H-FP1000A(01-23-2009)(09-04)

Time Max: 2.00E-07 Sec
 Min: 0.00E+00 Sec
 Amp Max: 1.36E+02 Amps/m
 Min: 0.00E+00 Amps/m

Description :



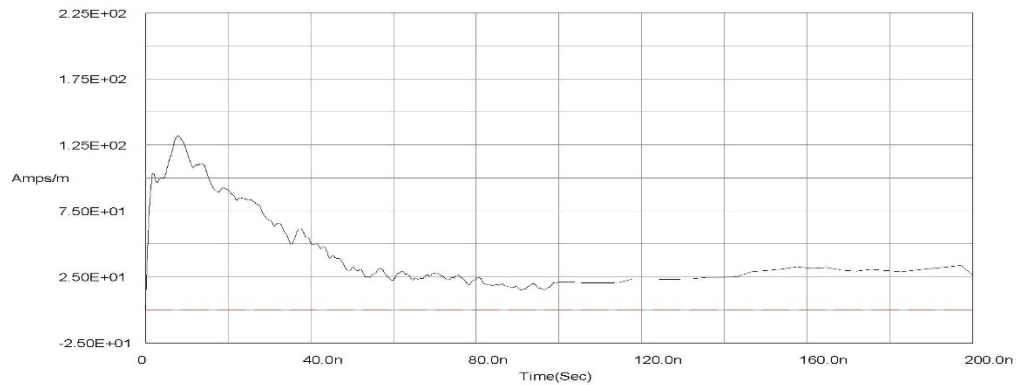
RS-105 Simulator H-Field Calibration

8/15/2018 12:59:22 PM

Test Point: Z AXIS TOPLIT SWING BOLT
 Test Date: 08-15-2018 12:57:57
 Test Type: Time Domain Acquisition
 Facility: Dayton T Brown
 Sig Probe: H-FP1000A(01-23-2009)(09-04)

Time Max: 2.00E-07 Sec
 Min: 0.00E+00 Sec
 Amp Max: 1.32E+02 Amps/m
 Min: 0.00E+00 Amps/m

Description :



Test Item:	Prologic / Swing Bolt	Date:	8-15-18
Customer:	SecuRam Systems, Inc.	Serial No.:	See Table 2
Test Mode:	Operational	Job No.:	416478
Specification:	MIL-STD-461G	Technician:	P. Kelly
Procedure:	MIL-STD-461G		

Radiated Susceptibility, Method RS105, Transient Electromagnetic Field **Met Requirement** Yes ☒ No ☐

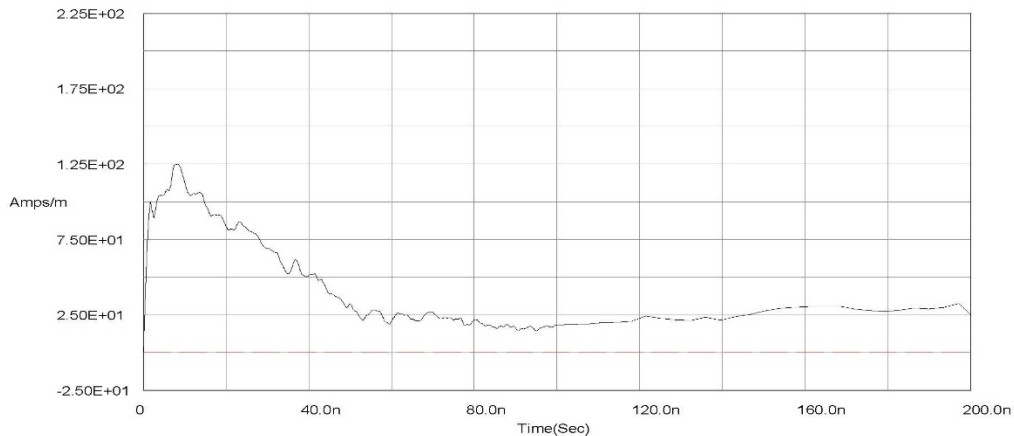
Applied Level (V/m)	Number of Pulses	Pulse Rate	Susceptibility Threshold Level (V/m)	Observation
50kV	5	1 Pulse per minute X-Axis	N/A	EUT functioned properly after application of the pulses.
50kV	5	1 Pulse per minute Y-Axis	N/A	EUT functioned properly after application of the pulses.
50kV	5	1 Pulse per minute Z-Axis	N/A	EUT functioned properly after application of the pulses.

RS-105 Simulator H-Field Calibration

8/15/2018 11:58:27 AM

Test Point: X AXIS PRO LOGIC SWING BOLT Time Max: 2.00E-07 Sec
 Test Date: 08-15-2018 11:57:38 Min: 0.00E+00 Sec
 Test Type: Time Domain Acquisition Amp Max: 1.25E+02 Amps/m
 Facility: Dayton T Brown Min: 0.00E+00 Amps/m
 Sig Probe: H-FP1000A(01-23-2009)(09-04)

Description :

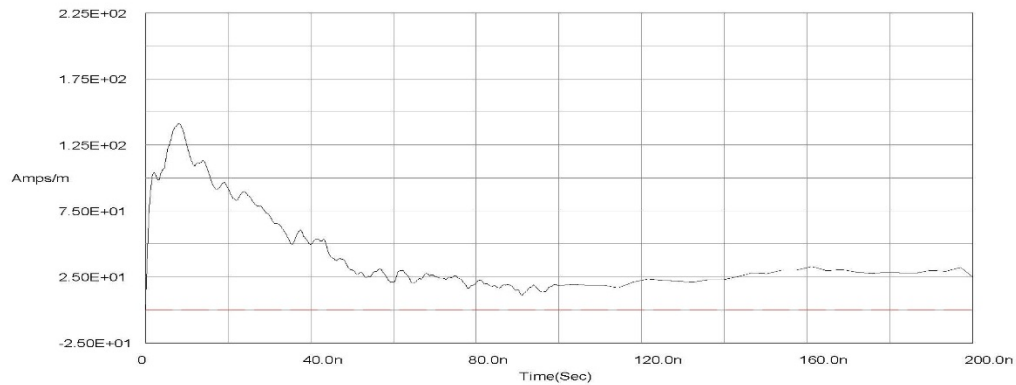


RS-105 Simulator H-Field Calibration

8/15/2018 12:11:20 PM

Test Point: Y AXIS PROLOGIC SWING BOLT Time Max: 2.00E-07 Sec
 Test Date: 08-15-2018 12:10:34 Min: 0.00E+00 Sec
 Test Type: Time Domain Acquisition Amp Max: 1.41E+02 Amps/m
 Facility: Dayton T Brown Min: 0.00E+00 Amps/m
 Sig Probe: H-FP1000A(01-23-2009)(09-04)

Description :

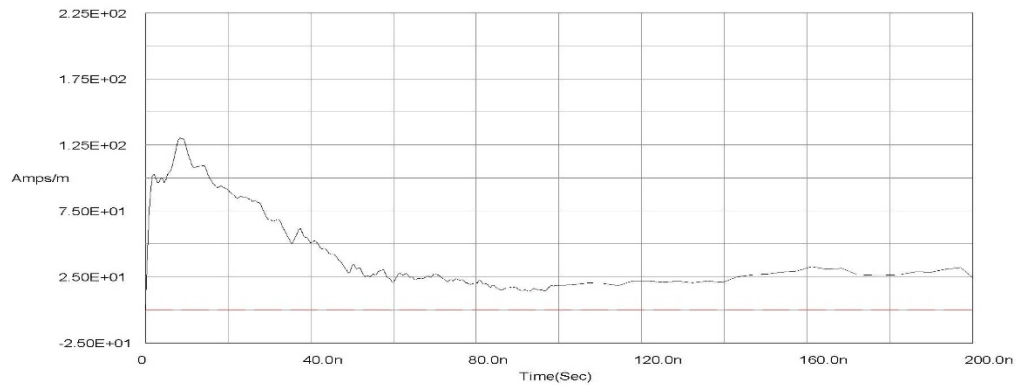


RS-105 Simulator H-Field Calibration

8/15/2018 12:20:45 PM

Test Point: Z AXIS PROLOGIC SWING BOLT Time Max: 2.00E-07 Sec
 Test Date: 08-15-2018 12:19:48 Min: 0.00E+00 Sec
 Test Type: Time Domain Acquisition Amp Max: 1.30E+02 Amps/m
 Facility: Dayton T Brown Min: 0.00E+00 Amps/m
 Sig Probe: H-FP1000A(01-23-2009)(09-04)

Description :



Test Item: V8 Door Lock
Customer: SecuRam Systems, Inc.
Test Mode: Operational
Specification: MIL-STD-461G
Procedure: MIL-STD-461G

Date: 8-15-18
Serial No.: See Table 2
Job No.: 416478
Technician: P. Kelly

Radiated Susceptibility, Method RS105, Transient Electromagnetic Field

Met Requirement

Yes ☒ No ☐

Applied Level (V/m)	Number of Pulses	Pulse Rate	Susceptibility Threshold Level (V/m)	Observation
50kV	5	1 Pulse per minute X-Axis	N/A	EUT functioned properly after application of the pulses.
50kV	5	1 Pulse per minute Y-Axis	N/A	EUT functioned properly after application of the pulses.
50kV	5	1 Pulse per minute Z-Axis	N/A	EUT functioned properly after application of the pulses.

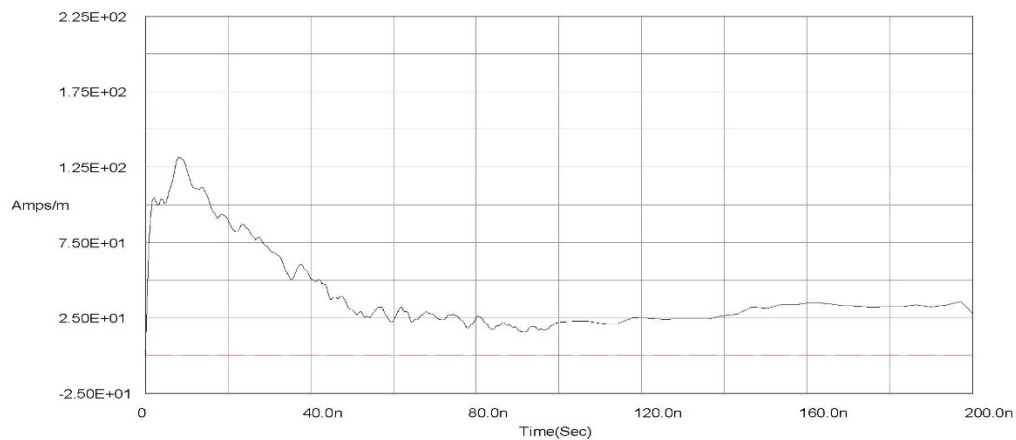
RS-105 Simulator H-Field Calibration

8/15/2018 1:13:18 PM

Test Point: X AXIS V8 DOOR LOCK
 Test Date: 08-15-2018 13:12:10
 Test Type: Time Domain Acquisition
 Facility: Dayton T Brown
 Sig Probe: H-FP1000A(01-23-2009)(09-04)

Time Max: 2.00E-07 Sec
 Min: 0.00E+00 Sec
 Amp Max: 1.31E+02 Amps/m
 Min: 0.00E+00 Amps/m

Description :



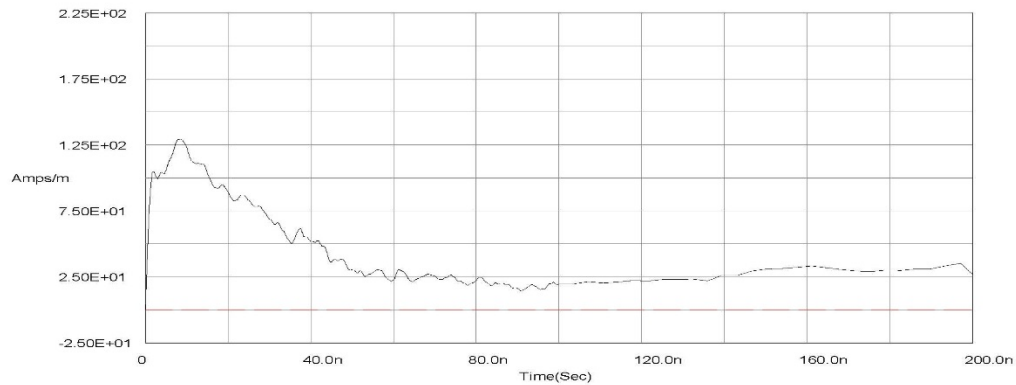
RS-105 Simulator H-Field Calibration

8/15/2018 1:21:03 PM

Test Point: Y AXIS V8 DOOR LOCK
 Test Date: 08-15-2018 13:20:16
 Test Type: Time Domain Acquisition
 Facility: Dayton T Brown
 Sig Probe: H-FP1000A(01-23-2009)(09-04)

Time Max: 2.00E-07 Sec
 Min: 0.00E+00 Sec
 Amp Max: 1.29E+02 Amps/m
 Min: 0.00E+00 Amps/m

Description :



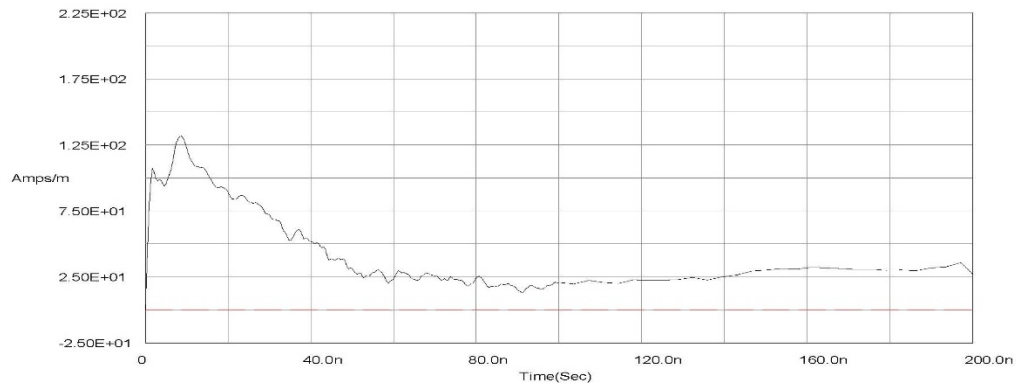
RS-105 Simulator H-Field Calibration

8/15/2018 1:30:12 PM

Test Point: Z AXIS V8 DOORLOCK
 Test Date: 08-15-2018 13:29:27
 Test Type: Time Domain Acquisition
 Facility: Dayton T Brown
 Sig Probe: H-FP1000A(01-23-2009)(09-04)

Time Max: 2.00E-07 Sec
 Min: 0.00E+00 Sec
 Amp Max: 1.32E+02 Amps/m
 Min: 0.00E+00 Amps/m

Description :



Test Item:	Card Lock	Date:	8-15-18
Customer:	SecuRam Systems, Inc.	Serial No.:	See Table 2
Test Mode:	Operational	Job No.:	416478
Specification:	MIL-STD-461G	Technician:	P. Kelly
Procedure:	MIL-STD-461G		

Radiated Susceptibility, Method RS105, Transient Electromagnetic Field **Met Requirement** Yes ☒ No ☐

Applied Level (V/m)	Number of Pulses	Pulse Rate	Susceptibility Threshold Level (V/m)	Observation
50kV	5	1 Pulse per minute X-Axis	N/A	EUT functioned properly after application of the pulses.
50kV	5	1 Pulse per minute Y-Axis	N/A	EUT functioned properly after application of the pulses.
50kV	5	1 Pulse per minute Z-Axis	N/A	EUT functioned properly after application of the pulses.

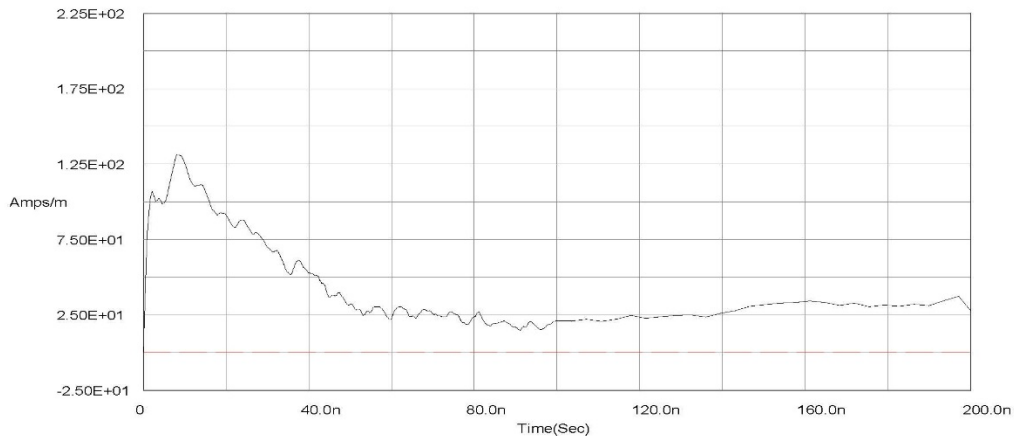
RS-105 Simulator H-Field Calibration

8/15/2018 1:40:24 PM

Test Point: X AXIS CARD LOCK
 Test Date: 08-15-2018 13:39:48
 Test Type: Time Domain Acquisition
 Facility: Dayton T Brown
 Sig Probe: H-FP1000A(01-23-2009)(09-04)

Time Max: 2.00E-07 Sec
 Min: 0.00E+00 Sec
 Amp Max: 1.32E+02 Amps/m
 Min: 0.00E+00 Amps/m

Description :



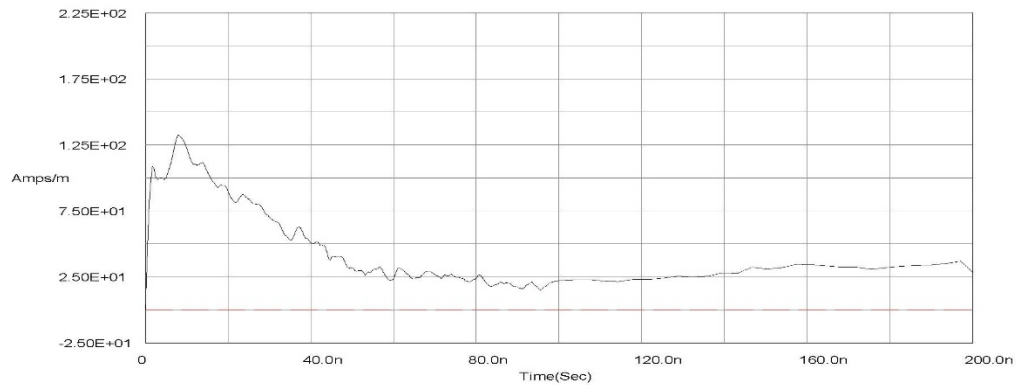
RS-105 Simulator H-Field Calibration

8/15/2018 1:44:50 PM

Test Point: Y AXIS CARDLOCK
 Test Date: 08-15-2018 13:44:16
 Test Type: Time Domain Acquisition
 Facility: Dayton T Brown
 Sig Probe: H-FP1000A(01-23-2009)(09-04)

Time Max: 2.00E-07 Sec
 Min: 0.00E+00 Sec
 Amp Max: 1.32E+02 Amps/m
 Min: 0.00E+00 Amps/m

Description :



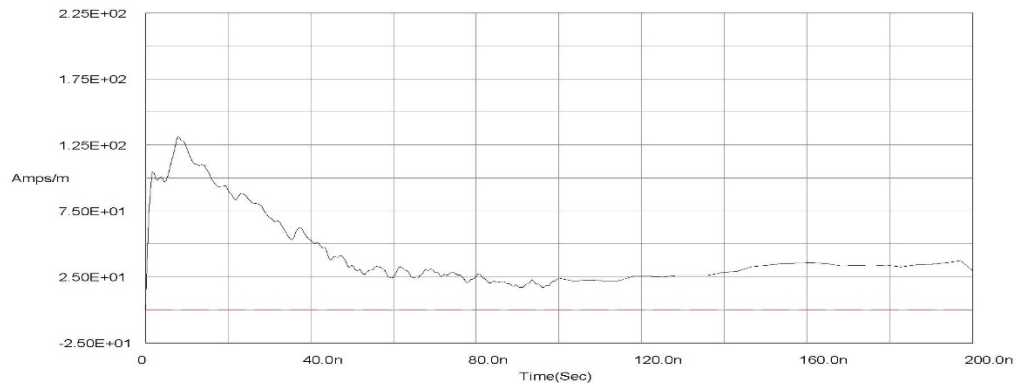
RS-105 Simulator H-Field Calibration

8/15/2018 1:49:59 PM

Test Point: Z AXIS CARDLOCK
 Test Date: 08-15-2018 13:49:12
 Test Type: Time Domain Acquisition
 Facility: Dayton T Brown
 Sig Probe: H-FP1000A(01-23-2009)(09-04)

Time Max: 2.00E-07 Sec
 Min: 0.00E+00 Sec
 Amp Max: 1.31E+02 Amps/m
 Min: 0.00E+00 Amps/m

Description :



9.1.8 RS105, Test Setup Diagram(s)

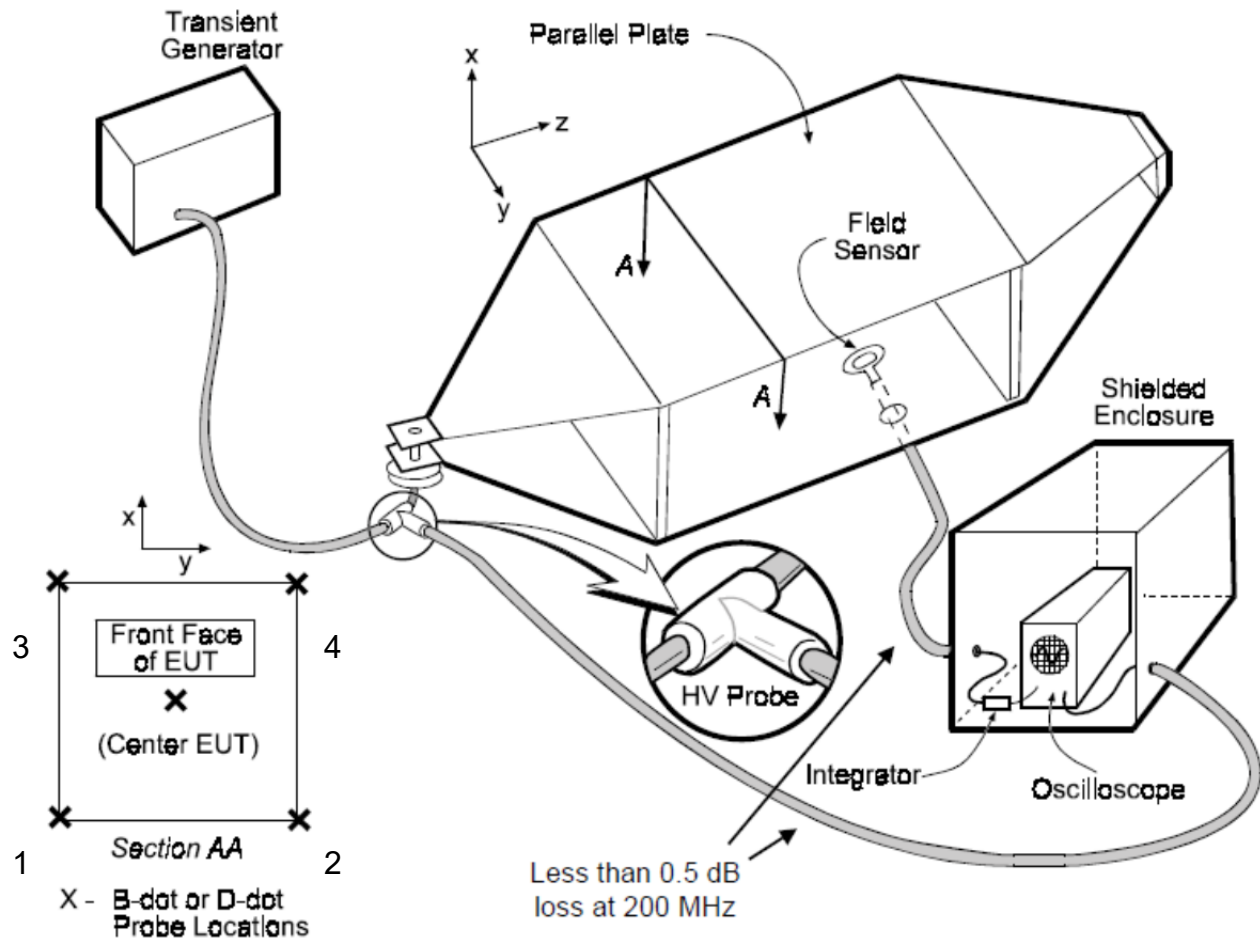


Figure 2 - RS105, Calibration Verification Setup

TOP VIEW

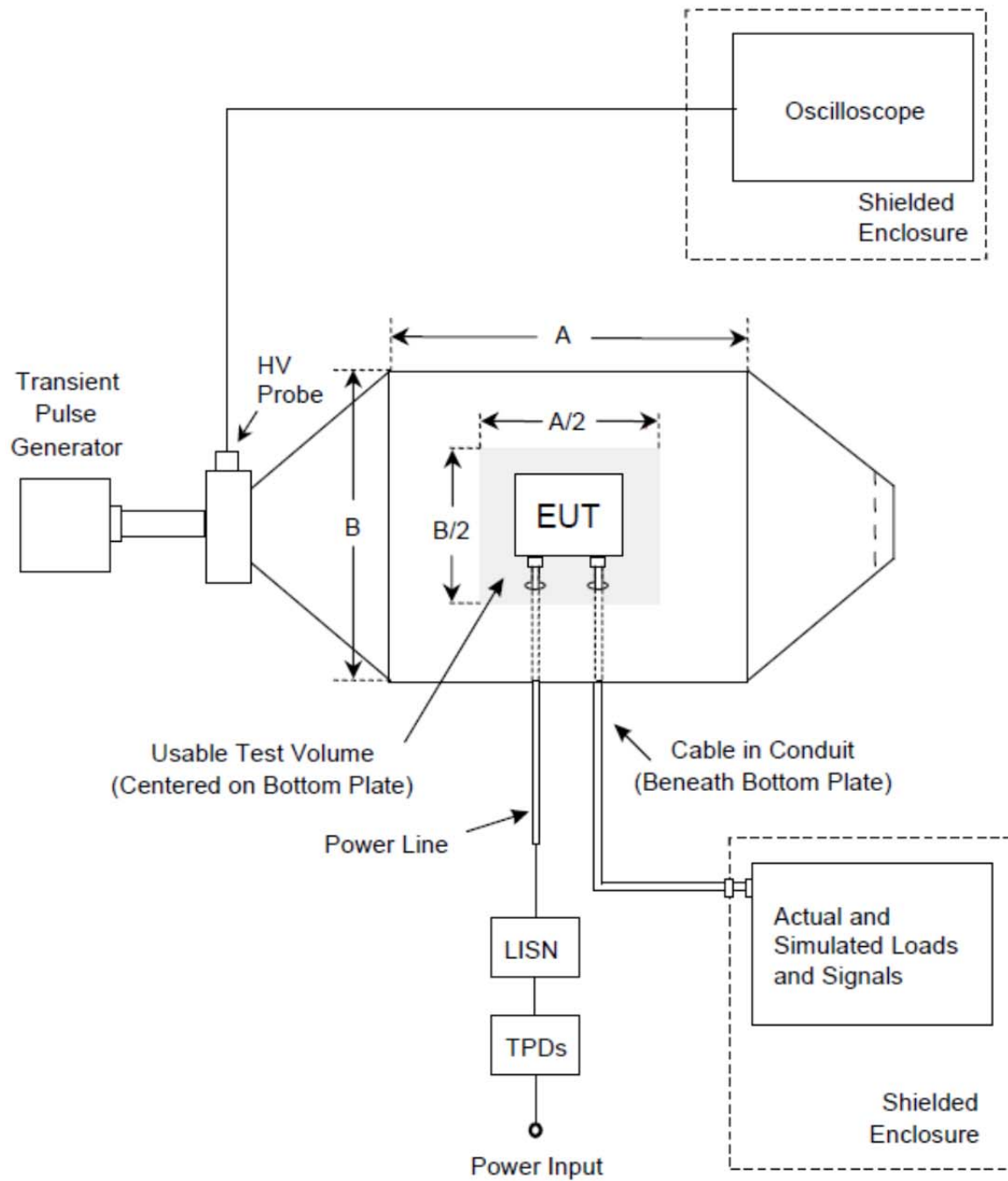


Figure 3 - RS105, Typical Test Setup

9.1.9 RS105, Test Setup Photograph(s)



Backlit / Swing Bolt



Backlit / Swing Bolt



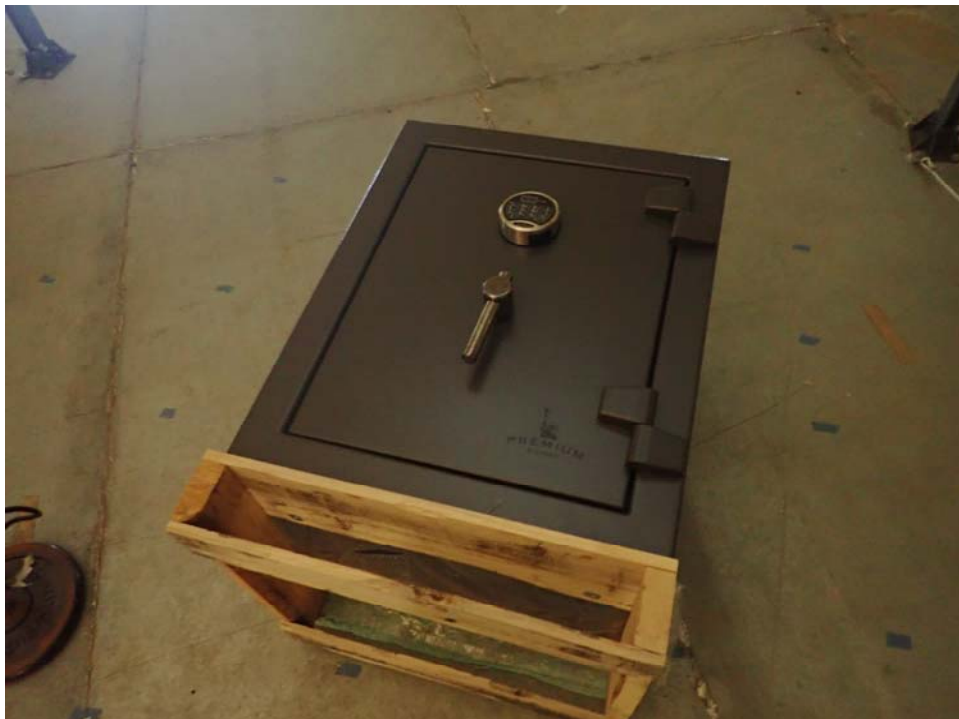
Backlit / Swing Bolt



Prologic / Swing Bolt



Prologic / Swing Bolt



Prologic / Swing Bolt



Toplit / Swing Bolt



Toplit / Swing Bolt



Toplit / Swing Bolt



V8 Door Lock



V8 Door Lock



V8 Door Lock



Card Lock



Card Lock



Card Lock

Job No: 416478

Date: 8/15/17

Test Method: RS105

Technician: P Kelly

(Print out)

Time	Remarks	Init.
8:00	Get safes brought over	N
	to OATS Building	N
9:00	Customer starts installing locks	N
	on safes.	N
10:47	Start Backlit swing bolt lock X	N
	5 hits customer performs checks	N
	and is OK with going to next	N
	Start backlit swing bolt lock Y	N
	5 hits customer performs checks	N
	Start backlit swing bolt lock Z	N
	5 hits customer performs checks	N
11:00	lunch	N
12:30	Back for lunch	N
12:35	Customer changes locks	N
12:49	Start X axis prologic swing bolt	N
	5 hits customer does checks	N
	Start Y axis prologic swing bolt	N
	5 hits customer performs checks	N
13:18	Start Z axis prologic swing bolt	N
	from	N
13:35	Start X axis top/it swing bolt	N
	5 hits customer performs checks	N
	Start Y axis top/it swing bolt	N
	5 hits customer performs checks	N
	Start Z axis top/it swing bolt	N
	5 hits customer performs checks	N
14:02	Safes complete.	N
14:12	Start V8 Door lock X axis	N
	5 hits customer performs checks	N
	Start V8 Door lock Y axis	N
	5 hits customer performs checks	N

