Measurement/Technical Test Report

Report Number: 09/11/02-02CA04665

GE-Interlogix

12345 SW LEVETON DR

TUALATIN OR 97062

ATS-1190, ATS-1192 and NX-1700E

FCC IDs: CGGATS1190-1192, CGGNX-1700E

September 11, 2002

This report concerns:	Original Authorization Equipment type: Intentional Radiator
Report prepared by: Approved by: Tests Performed by: NVLAP Signatory	Douglas M. Smith Underwriters Laboratories Inc. 2600 NW Lake Road Camas, WA 360-817-5660 (phone) 360-817-6058 (fax) Douglas.M.Smith@us.ul.com

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1 GENERAL INFORMATION

1.1 Product Description

- Model - ATS-1190, ATS-1192 and NX-1700E
- Product Type – Intentional Radiator(s)
- Product Components or Parts - The device(s) are printed circuit boards housed in molded plastic enclosures and are connected to a remote controller via single multi wire cable. The device(s) receive power from the controller circuitry and not directly from the AC mains.
- Product Function - The device is part of a door access system that utilizes proximity cards for activation of a door strike relay.

1.2 Applicable FCC Authorization Procedure

The authorization procedure selected for this product is Certification. This is based on the table in Paragraph 15.201(b).

1.3 Related Submittal(s)/Grant(s)

There are no related grants as part of this report.

1.4 Tested System Details

The FCC ID's (where available) for all equipment other than the product being evaluated, including inserted or plug-in cards, which have grants, plus descriptions of all cables used in the tested system are as follows:

#	Device Description / FCC ID (if any)	Manufacturer	Model No.	Serial No.
D1	main control board / None	GE-Interlogix	ATS-4000	None
D2	computer and printer interface / None	GE-Interlogix	ATS-1801	None
D3	8 meg expansion module / None	GE-Interlogix	ATS-1832	None
D4	1 meg expansion module / None	GE-Interlogix	ATS-1832	None
D5	remote arming station (RAS)/ None	GE-Interlogix	ATS-1100	None
D6	door controller / None	GE-Interlogix	ATS-1170	None
D7	data gathering panel / None	GE-Interlogix	ATS-1201	None
D8	data gathering panel / None	GE-Interlogix	ATS-1210	None
D9	data gathering panel / None	GE-Interlogix	ATS-1220	None
D10	door controller / None	GE-Interlogix	ATS-1250	None
D11	NA	NA	NA	NA
D12	main controller / None	GE-Interlogix	NX-8E	None
D13	remote arming station (RAS)/ None	GE-Interlogix	NX148E	None
D14	plug in class 2 transformer (NX-8E Sys) / None	Universal	UB16401	J01C
D15	plug in class 2 transformer / None	Basler Electric	None	None
D16	EUT card reader / None	GE-Interlogix	ATS-1190	None
D17	EUT card reader / None	GE-Interlogix	ATS-1192	None
D18	EUT card reader / none	GE-Interlogix	NX1700E (Master)	02025541
D19	EUT card reader / None	GE-Interlogix	NX1700E (Slave)	02025551

Cable Descriptions

#	Cable Use / Description	Manufacturer	Connectors In/Out	Shielding Type / Shield Bonding	Length (meters)
C1A	NX1700E Master / I/O line	MM Cables	PC / polarized 4 pin female	None / None	0.92
C1B	NX1700E Master / 22AWG 4 wire	Genesis	PC / polarized 4 pin male	None / None	1.93
C2A	NX1700E Slave / 22AWG 4 wire	MM Cables	PC / polarized 4 pin female	None / None	0.92
C2B	NX1700E Slave / 22AWG 4 wire	Genesis	PC / polarized 4 pin male	None / None	3
C3	NX148E / 22AWG 4 wire	Genesis	PC / PC	None / None	2.6
C4	Class 2 direct plug in transformer / 18AWG 2 wire	None	PC / PC	None / None	1.3
C5	I/O Buss / 22 AWG 16 wire	None	PC / PC	None / None	2.65
C6	Class 2 direct plug in transformer / 18AWG 2 wire	Basler Electric	PC / PC	None / None	2.75
C7A	I/O / 22AWG 4 wire	Genesis	PC / polarized 4 pin male	None / None	1.3
C7B	I/O / 22AWG 4 wire	Genesis	PC / polarized 4 pin female	None / None	1.3
C8	ATS-1190 /I/O line	None	PC / PC	None / None	3.33
C9A	I/O / 22AWG 4 wire	Genesis	PC / polarized 4 pin male	None / None	1.3
C9B	I/O / 22AWG 4 wire	Genesis	PC / polarized 4 pin female	None / None	1.3
C10	I/O Buss / 22 AWG 16 wire	None	PC / PC	None / None	3
C11A	I/O / 22AWG 4 wire	Genesis	PC / polarized 4 pin male	None / None	1.3
C11B	I/O / 22AWG 4 wire	Genesis	PC / polarized 4 pin female	None / None	1.3
C12	I/O Buss / 22 AWG 16 wire	None	PC / PC	None / None	3
C13A	I/O / 22AWG 4 wire	Genesis	PC / polarized 4 pin male	None / None	1.3
C13B	I/O / 22AWG 4 wire	Genesis	PC / polarized 4 pin female	None / None	1.3
C14A	I/O / 22AWG 4 wire	Genesis	PC / polarized 4 pin male	None / None	1.3
C14B	I/O / 22AWG 4 wire	Genesis	PC / polarized 4 pin female	None / None	1.3
C15A	ATS1192 / I/O	None	PC / polarized 4 pin male	None / None	2.5
C15B	I/O / 22AWG 4 wire	Genesis	PC / polarized 4 pin female	None / None	1.3
C16	I/O Buss / 22 AWG 32 wire	None	PC / PC	None / None	3
C17	AC mains / 18 AWG 3 wire	Lord Hero	PC / appliance plug cap	None / None	1.3
C18	I/O Buss / 22 AWG 32 wire	None	PC / PC	None / None	3
C19	AC mains / 18 AWG 3 wire	Da Tung	PC / appliance plug cap	None / None	1.3

1.5 Test Methodology

Both conducted and radiated testing were performed according to:

FCC Part 15, Subpart C (2002) and ANSI C63.4-1992

1.6 Test Facility

The pre-compliance emissions chamber, open area test site and conducted measurement test station used to collect the data in this report is located on the first floor of:

Underwriters Laboratories Inc.
2600 N.W. Lake Road
Camas, WA 98607
Phone: 360-817-5500

This site has been fully described in a report, submitted to the FCC, and accepted in a letter dated May 5, 2000 (Registration No.: 91042).

1.7 Test Equipment – Radiated Emission Measurements:

✓	Type	Manufacturer	Model No.	Serial #	Calibra-tion Due	UL ID
? ✓	Receiver System	Hewlett Packard	8572A	3020A00455	1-15-03	601
? ✓	BiConiLog Antenna	EMC Test Systems	3141	1204	8-14-03	1163
? ✓	Biconnical Antenna	Electro-Metrics	EM-6912A	113, 121	10-30-02	702
? ✓	Log Periodic Antenna	Electro-Metrics	EM-6950	913	10-25-02	530
? ✓	Loop Antenna.	Electro-Metrics	EM-6872	140	1-18-03	538

1.8 Test Equipment - Conducted Voltage measurements

✓	Type	Manufacturer	Model No.	Serial #	Calibra-tion Due	UL ID
✓ ?	Transient Limiter	Electro-Metrics	EM-7600	112626	1-18-03	803
? ✓	LISN	Fischer Custom	FCC-LISN-50/250-25-2	01014	10-31-02	1363
? ✓	LISN	Fischer Custom	FCC-LISN-50/250-25-2	01015	10-31-02	1364

✓	Type	Manufacturer	Model No.	Serial #	Calibra-tion Due	UL ID
? ✓	Spectrum Analyzer	Advantest	R3361D	81729342	3-20-03	839
? ✓	Preselector	Advantest	R3351	82970023	3-20-03	840

1.9 Traceability of Measurements

Unless otherwise indicated calibration of equipment referenced within this Report is traceable to NIST.

2 PRODUCT LABELING AND USER INFORMATION

2.1 Label for Part 15 Certification or Verification

Paragraph 15.19 (a) of 47 CFR Ch. 1 (Aug. 20, 2002 Edition) states "In addition to the requirements in part 2 of this chapter, a device subject to certification, or verification shall be labeled as follows:"

In accordance with Paragraph 15.19(a)(3) of CFR 47; the device shall bear the following statement in a conspicuous location on the device; subject to the additional conditions given below. The layout and size are only for illustration purposes:

> This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

- In accordance with Paragraph 15.19(a)(4); where a device is constructed in two or more sections connected by wires and marketed together, the above statement is required to be affixed only to the main control unit.

- In accordance with Paragraph 15.19(a)(5); when the device is so small or for such use that it is not practical to place the above statement on it, the statement shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. However, the FCC identifier or the unique identifier, as appropriate, must be displayed on the device.

2.2 Information to User

In accordance with Paragraph 15.21 of CFR 47; the user's manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

3 SYSTEM TEST CONFIGURATION

3.1 Justification

The following paragraphs are to ANSI C63.4-1992 unless otherwise indicated.

In accordance with paragraph 6.1 and 11.1, the EUT and accessories, if any, were operated at the rated (nominal) operating voltage (120 Vac/60Hz) with typical load and/or test conditions to simulate typical operation. All necessary parts of the system were exercised and the test conditions have been documented in this report.

The EUT and accessories, if any, were placed in a typical configuration in accordance with paragraph 6.1.1, 6.1.2 and 6.2.

The interconnecting cable lengths were the most typical of all applications of normal usage. Where the cable length was unknown, cables of 1 m nominal length were used. The interconnecting cabling used was the specific cabling marketed with the EUT in practical applications or was the same specified in the user manual. This complies with paragraph 6.1.4.

The excess cable length was draped over the back edge of the tabletop and bundled in the center in a serpentine fashion using 30 - 40 cm lengths, where necessary, to keep the cable a minimum distance of 40 cm from the conducting ground plane. This method is described in paragraph 6.1.4.

The power cord(s) of the peripheral equipment was not bundled. These power cords were draped over the rear edge of the table and routed down onto the floor to the second LISN or through the turntable center opening. The power cords were not draped over the top of any LISN. This is in accordance with paragraph 6.1.4.

3.2 EUT Exercise Software

The device(s) do not use software.

3.3 Special Accessories

Special accessories or components provided as part of the device that support compliance, or that if removed, would require a retest are as follows:

Manufacturer	Model Number	Serial Number	Description
Fair-Rite	2643102002	None	Solid core ferrite
API Delevan	CFI-14.2*6.35*28.5	None	Solid core ferrite
N/A	N/A	N/A	Metal can over PCB on the ATS-1801

3.4 Equipment Modifications

To achieve compliance to Class B levels, the following changes were made by Underwriters Laboratories Inc. during compliance testing:

a. Fair-Rite solid core ferrites were put on both lines (Ph1 and Neutral) of the AC mains input to boards ATS-4000. Two passes of the mains wire was put through the center of the ferrite. See modification photographs, 6.19 and 6.20.
b. API solid core ferrites were put on both lines (Ph1 and Neutral) of the AC mains input to boards ATS-1250. Three passes of the mains wire was put through the center of the ferrite. See modification photographs, 6.17 and 6.18.
c. Addition of a shield (metal can) over PCB components on the ATS-1801. See modification photograph 6.21

Specific reason for modification: <u>To meet class B limit requirements</u>

The above modification(s) were made to the tested device for the reason(s) indicated and will be implemented on all production models of this equipment.

Applicant Signature ____________________________ Date ____________________

Typed/Printed Name ___________________________ Position _________________

3.5 Configuration of Tested System

The following test configuration represents the worse case configuration for emissions. The emissions measurements made in this configuration represent the worst-case emissions for this system.

The EUT(s) was tested to the applied standards requirements for tabletop devices.

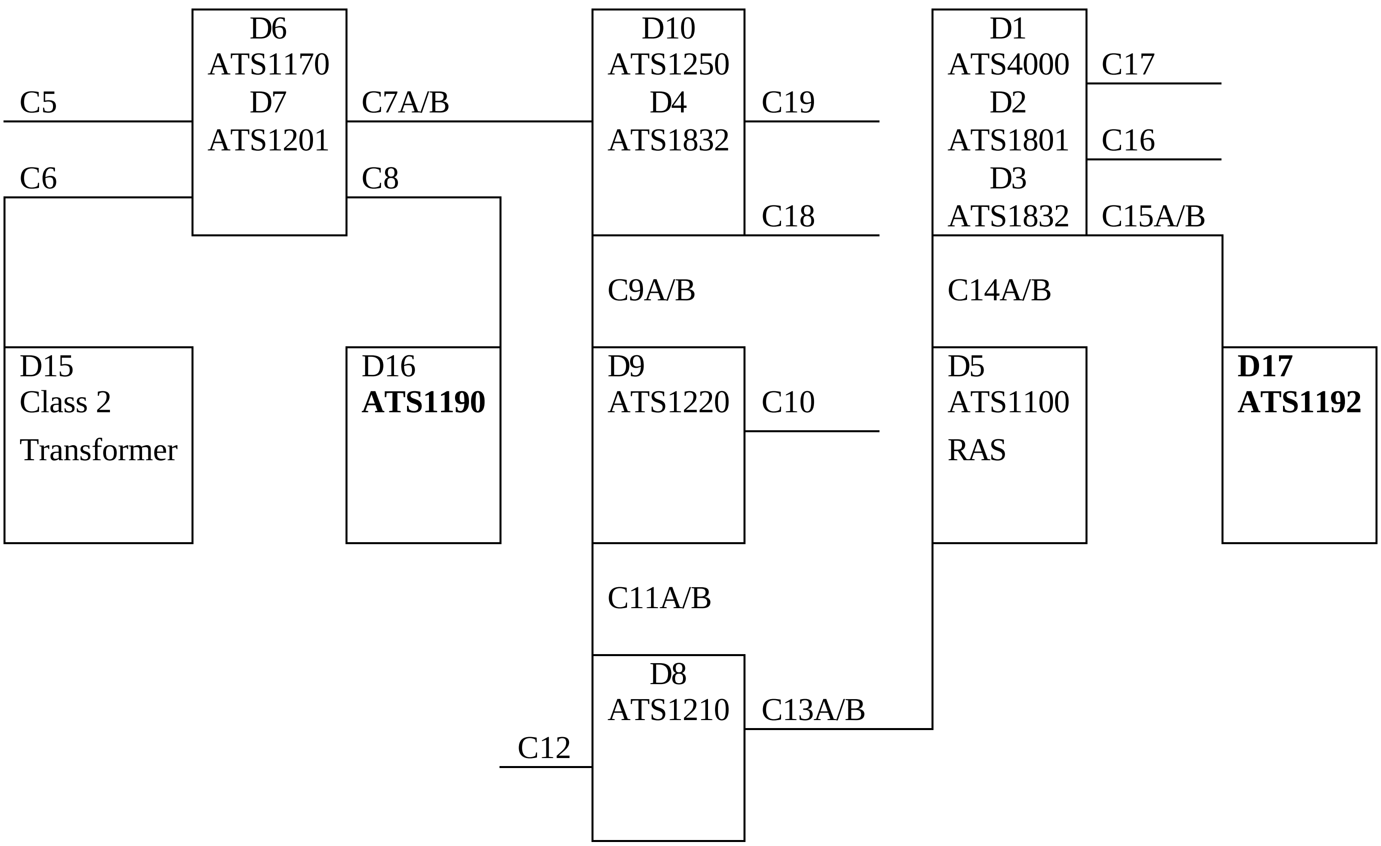
For the intentional radiators, it was found that the associated equipment (AE) was interfering with the maximization process of the measurements. The AE was removed from the tabletop leaving the intentional radiator to make more precise measurements.

Further description of test setup:
The EUT's were rotated about their axis to find the worst-case emissions during the preliminary measurements to determine orientation for final measurements.

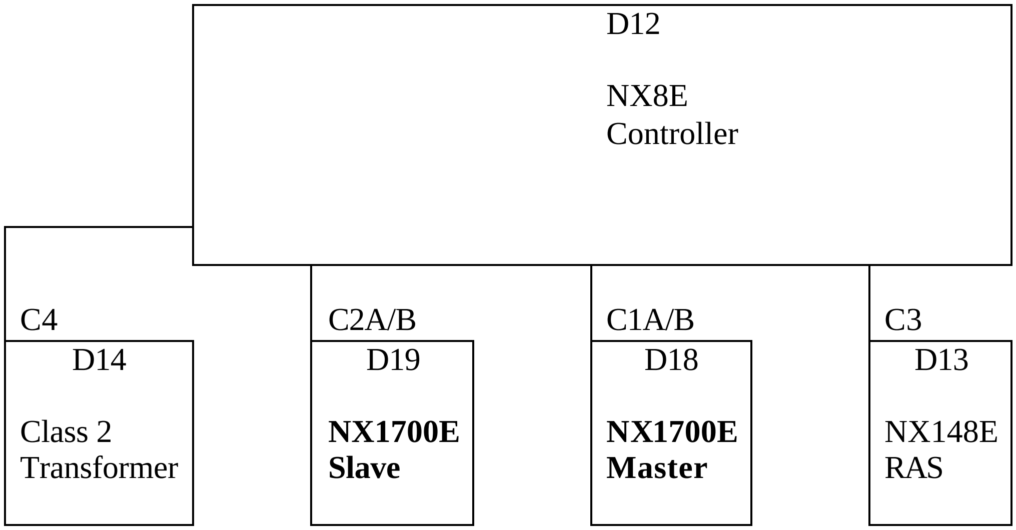
4 BLOCK DIAGRAM(S) OF TEST SETUPS FOR ATS-1190, ATS-1192 and NX-1700E

Note The ATS-4000, and NX-8E are separate operating systems.

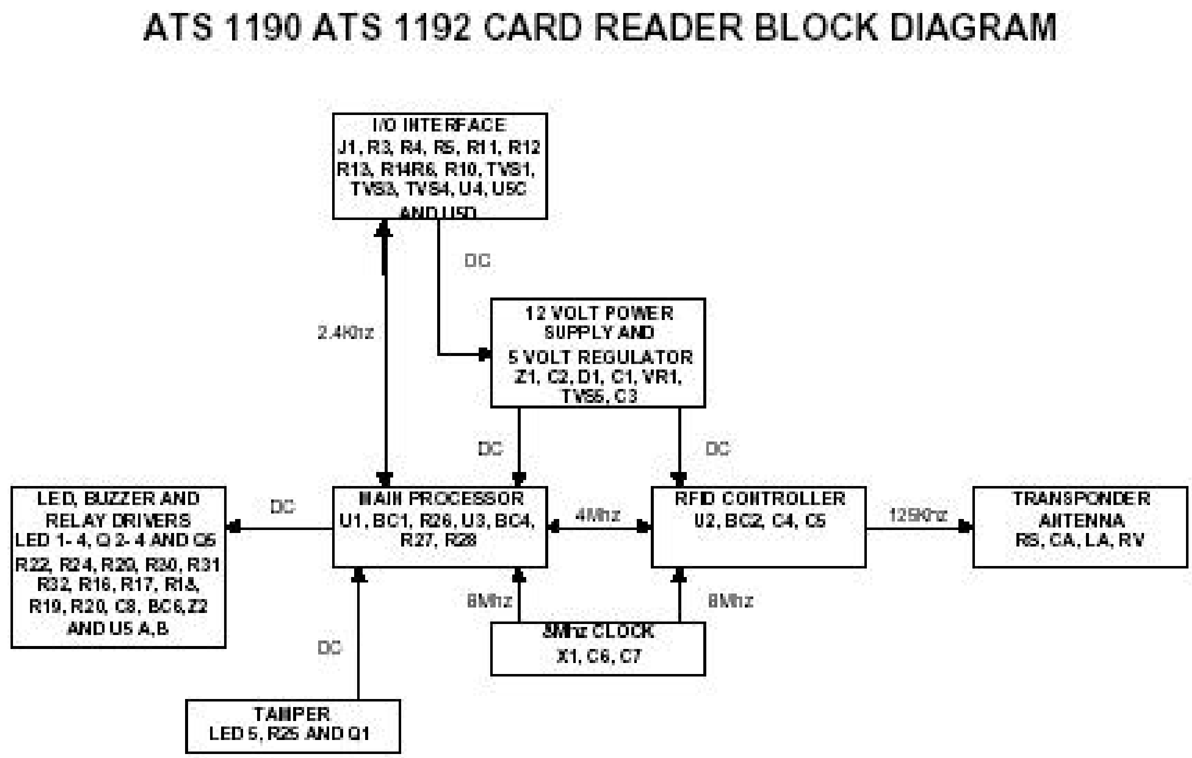
Block Diagram of Model ATS-1190, ATS-1192



Block Diagram of Model NX-1700E



5 BLOCK DIAGRAM(S) OF THE ATS-1190, ATS-1192 and NX-1700E



ATS-1190 and ATS-1192 BASIC OPERATION

BASIC OPERATION

The ATS 1190 and ATS 1192 are part of a Access Control and Security System (ATS 3000 / 4000) The ATS 1190 and ATS 1192 were designed to read RFID Transponders when they are in close proximity to the readers. In a typical installation a ATS 1190 or ATS 1192 card reader would be mounted close to an entry way door. The I/O interface would provide both 12 DC power and RS 485 data buss connections to the main control panel (ATS 3000/ 4000). Also, Wiegand & Magnetic stripe protocol data transfers are possible. When a valid user would require access through the entry way they would place their Transponder card in close proximity to the reader. The readers are continually polling every 170 Ms by enabling the 125 Khz carrier for 20Ms. During this polling the magnetic field produced by the reader would couple enough energy to the Transponder to provide operating power. Once the Transponder is powered up Via the magnetic field it would begin to modulate the 125 Khz carrier with the data pre-programmed with in the transponder. Once modulation is detected by the RFID Controller the data is then passed on to the Main Processor. This causes the Main Processor to stop the 20 Ms polling and run continually until the Transponder stops transmitting (moved away from the reader). The Data collected from the Transponder is processed by the reader's Main Processor and sent along to the main control panel (ATS 3000/4000) via the I/O interface. Data would then be received back from the main control for LED, Buzzer and relay control.

Additional functions provided by the main control panel would include the operation of electric door locks were the user could now gain access.

CIRCUIT DESCRIPTION

I/O Interface:

The I/O Interface is comprised of J1, and 8 conductor shielded cable used for the interconnection to the Main Control Panel (ATS 3000 / 4000). R1 -6, R13, R14 and R10 are used for input current limiting resistors. R11, R12, R7 and R8 are used as pull-up resistors. TVS1, TVS3, and TVS4 are used for input transient protection. U4 is used for RS485 data transfer between the ATS1190 / ATS1192 and the Main Control Panel while U5 C and D are used for Wiegand or Magnetic stripe data transfer to the ATS1250 Door1 to 4 inputs when operating in the offline mode.

12 VOLT POWER SUPPLY AND 5 VOLT REGULATOR: The 12 Volt Power Supply and 5 Volt Regulator is comprised of Z1,C1, C2, D1, which are used for input filtering, input transient protection, and reverse power protection. VR1 is a 5 volt liner regulator. TVS5 is used for transient protection. C3 provides output filtering.

MAIN PROCESSOR: Main Processor consists of U1 micro controller which processes data and controls RFID controller and LED, Buzzer and relay functions. U3 EEPROM provides nonvolatile memory. BC1 and BC4 are used for high frequency power supply bypass. R27 is used for data line pull-up and R28 is for DI/DO data anti collision.

8Mhz CLOCK: The 8Mhz clock consists of X1 a 8 Mhz crystal, C6 and C7 to form a 8 Mhz oscillator. This oscillator is used for the clock for both the Main Processor and the RFID controller.

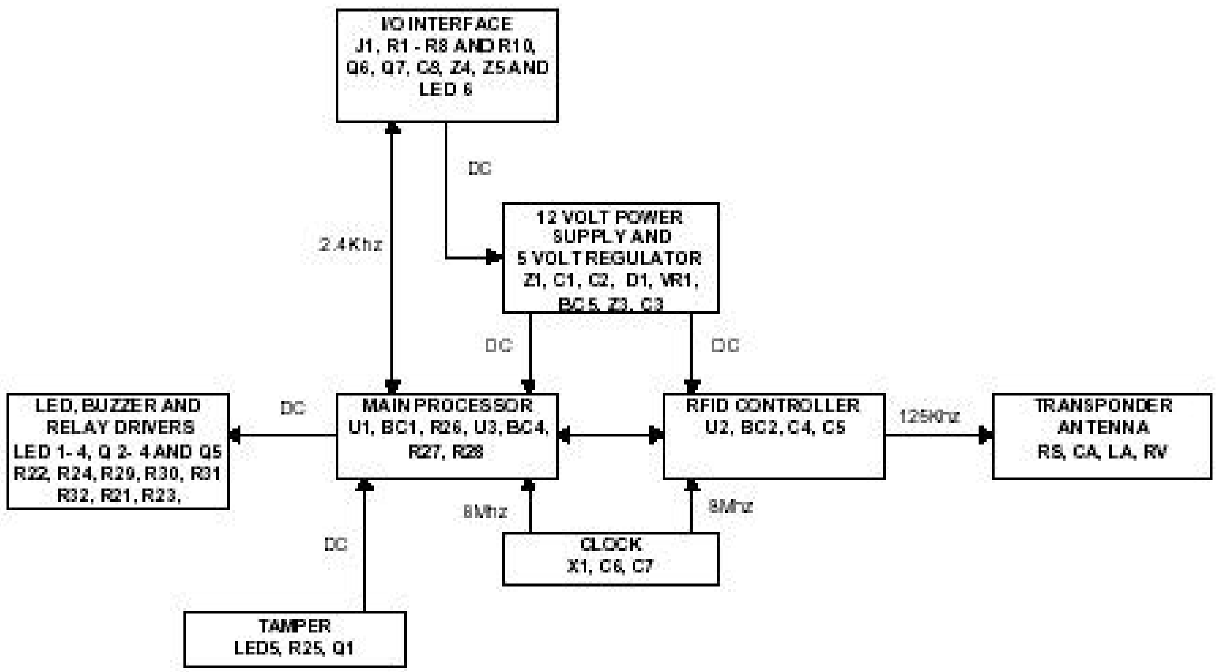
LED, BUZZER AND RELAY DRIVERS: The LED, Buzzer and relay Drivers consists of LED 1-4 , Q2, Q3, R22 and R24 which are used for programmable visual annunciation. B1, R29, R32 and Q4 are used for programmable audible annunciation. U5 A and U5 B R16, R17, R18, R19, R20, C8 and BC6 are used for input sensing for LED switching when in Wiegand or Magnetic Stripe mode. Q5, R31, R30 and Z2 provides an open collector output to drive a small load such as a relay.

TAMPER: The ATS 1190, ATS 1192 provides a optical tamper switch which senses the unit being removed from it's mounting surface. It consists of LED5, R25 and Q1.

RFID CONTROLLER: The RFID controller consists of U2 which divides the 8Mhz clock by 64 to produce the 125Khz carrier frequency. It also provides modulation and demodulation function from the carrier. It also provides the Transponder Antenna drive circuitry. C4 and C5 provide filtering for U2 input circuitry and BC2 provides high frequency power supply bypassing.

TRANSPONDER ANTENNA: The Transponder Antenna consists of LA which is a small wire coil used to produce a magnetic field when driven by the 125Khz signal produced by U2. RS, Ca and RV provide impedance matching.

NX-1700E CARD READER BLOCK DIAGRAM



BASIC OPERATION

The NX-1700E are part of a Access Control and Security System (NX SERIES CONTROL PANEL) The NX-1700E were designed to read RFID Transponders when they are in close proximity to the readers. In a typical installation a NX-1700E card reader would be mounted close to an entry way door. The I/O interface would provide both 12 DC power and RS 485 data buss connections to the main control panel (NX SERIES CONTROL PANEL). Also, Wiegand & Magnetic stripe protocol data transfers are possible. When a valid user would require access through the entry way they would place their Transponder card in close proximity to the reader. The readers are continually polling every 170 Ms by enabling the 125 Khz carrier for 20Ms. During this polling the magnetic field produced by the reader would couple enough energy to the Transponder to provide operating power. Once the Transponder is powered up Via the magnetic field it would begin to modulate the 125 Khz carrier with the data pre-programmed with in the transponder. Once modulation is detected by the RFID Controller the data is then passed on to the Main Processor. This causes the Main Processor to stop the 20 Ms polling and run continually until the Transponder stops transmitting (moved away from the reader). The Data collected from the Transponder is processed by the reader's Main Processor and sent along to the main control panel (NX SERIES CONTROL PANEL) via the I/O interface. Data would then be received back from the main control for LED, Buzzer and relay control. Additional functions provided by the main control panel would include the operation of electric door locks were the user could now gain access.

CIRCUIT DESCRIPTION

I/O Interface:

The I/O Interface is comprised of J1, and 8 conductor shielded cable used for the interconnection to the Main Control Panel (NX SERIES CONTROL PANEL). R8 and R10 are used for input current limiting resistors. R7 is used as pull-up resistor. Z4 and Z5 are used for input transient protection. Q6 and Q7 are used for data transfer between the NX-1700E and the Main Control. R1 - R6 and LED 6 are used for biasing Q6 and Q7.

12 VOLT POWER SUPPLY AND 5 VOLT REGULATOR:

The 12 Volt Power Supply and 5 Volt Regulator is comprised of Z1,C1, C2, D1, which are used for input filtering, input transient protection, and reverse power protection. VR1 is a 5 volt liner regulator. Z3 is used for transient protection. C3 provides output filtering.

MAIN PROCESSOR:

Main Processor consists of U1 micro controller which processes data and controls RFID controller and LED, Buzzer and relay functions. U3 EEPROM provides nonvolatile memory. BC1 and BC4 are used for high frequency power supply bypass. R27 is used for data line pull-up and R28 is for DI/DO data anti collision.

8Mhz CLOCK:

The 8Mhz clock consists of X1 a 8 Mhz crystal, C6 and C7 to form a 8 Mhz oscillator. This oscillator is used for the clock for both the Main Processor and the RFID controller.

LED, BUZZER AND RELAY DRIVERS:

The LED, Buzzer and relay Drivers consists of LED 1-4 , Q2, Q3, R22 and R24 which are used for programmable visual annunciation. B1, R29, R32 and Q4 are used for programmable audible annunciation. Q5, R31, R30 and Z2 provides an open collector output to drive a small lo ad such as a relay.

TAMPER:

The NX-1700 provides a optical tamper switch which senses the unit being removed from it's mounting surface. It consists of LED5, R25 and Q1.

RFID CONTROLLER:

The RFID controller consists of U2 which divides the 8Mhz clock by 64 to produce the 125Khz carrier frequency. It also provides modulation and demodulation function from the carrier. It also provides the Transponder Antenna drive circuitry. C4 and C5 provide filtering for U2 input circuitry and BC2 provides high frequency power supply bypassing.

TRANSPONDER ANTENNA:

The Transponder Antenna consists of LA which is a small wire coil used to produce a magnetic field when driven by the 125Khz signal produced by U2. RS, Ca and RV provide impedance matching.

6 CONDUCTED AND RADIATED MEASUREMENT PHOTOS

Figure 6.1 - Conducted Voltage Emissions Measurement Configuration (ATS-1190)

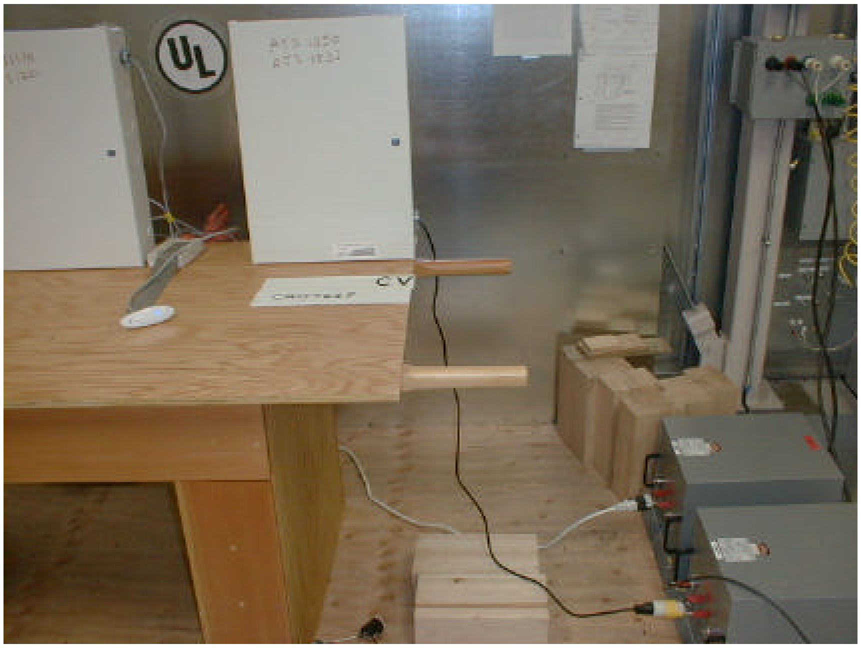


Figure 6.2 - Conducted Voltage Emissions Measurement Configuration (ATS-1190)

Figure 6.3 - Conducted Voltage Emissions Measurement Configuration (ATS-1190)

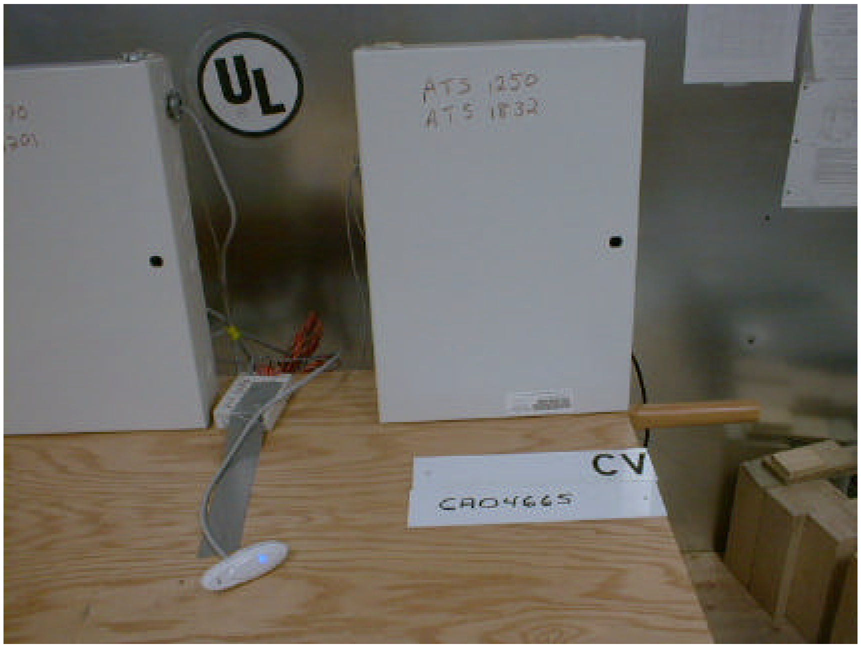


Figure 6.4 - Conducted Voltage Emissions Measurement Configuration (ATS-1192)

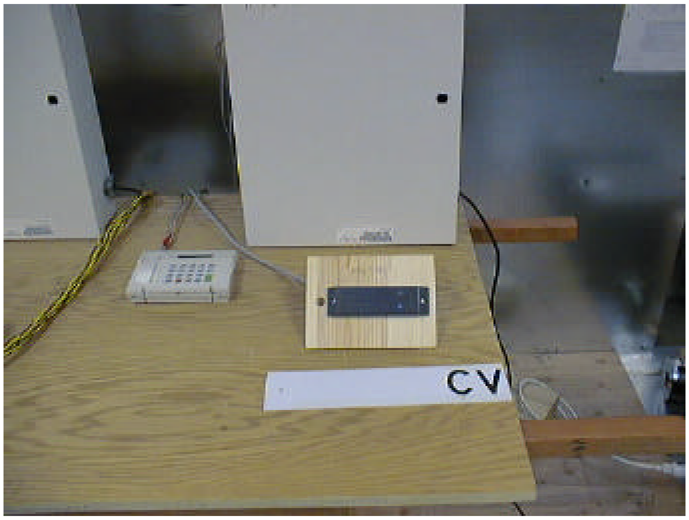


Figure 6.5 - Conducted Voltage Emissions Measurement Configuration (NX-1700E)

Figure 6.6 - Conducted Voltage Emissions Measurement Configuration (NX-1700E)

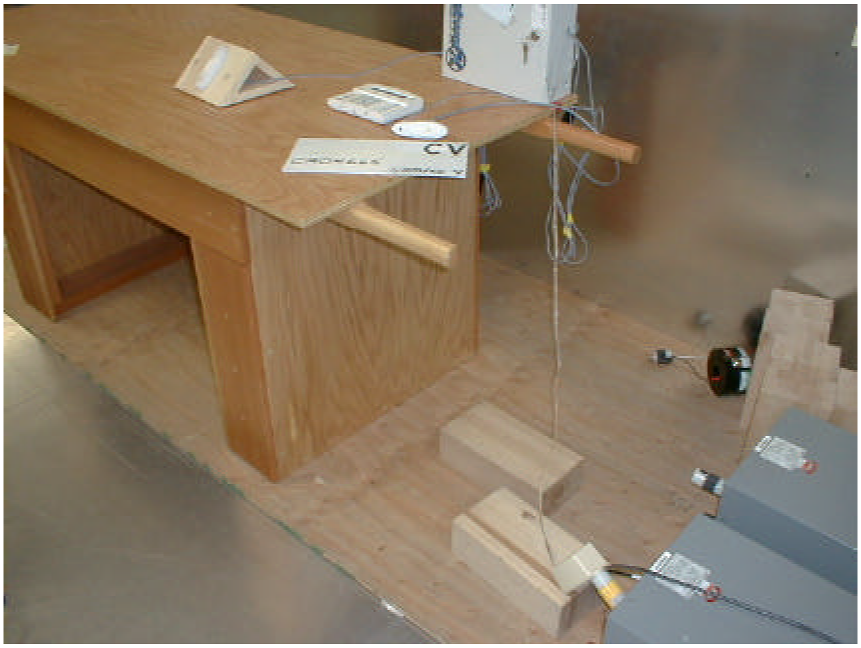


Figure 6.7 - Radiated Emissions, Precompliance, 3m Chamber

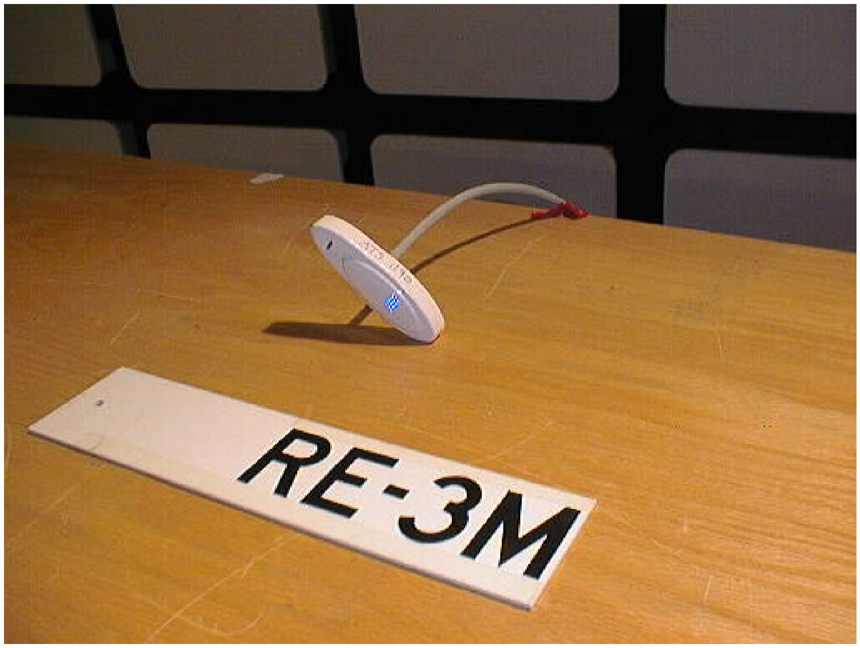


Figure 6.8 - Radiated Emissions, Precompliance, 3m Chamber

Figure 6.9 - Radiated Emissions, Precompliance, 3m Chamber

Figure 6.10 - Radiated Emissions, Precompliance, 3m Chamber

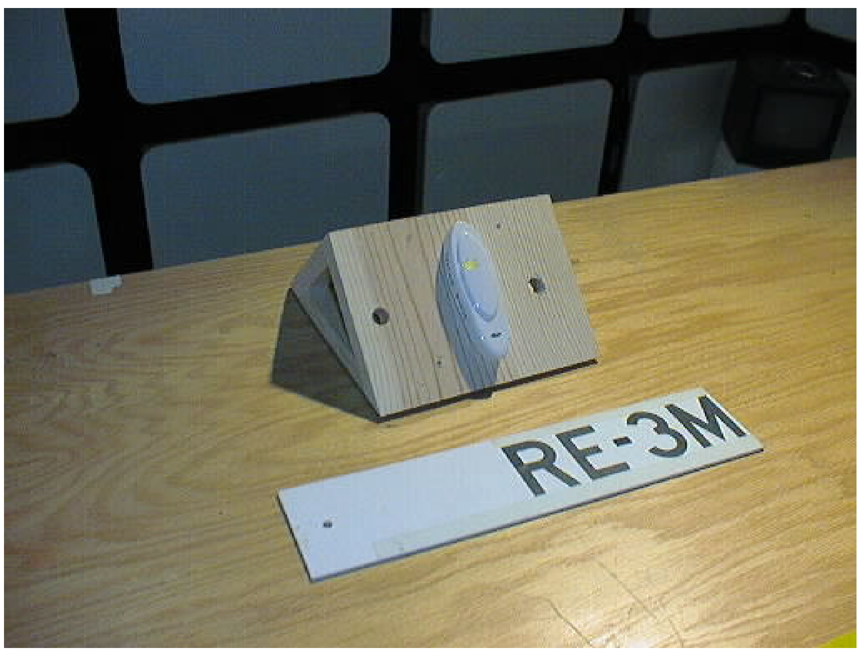


Figure 6.11 - Radiated Emissions, Precompliance, 3m Chamber

Figure 6.12 - Radiated Emissions, Precompliance, 3m Chamber

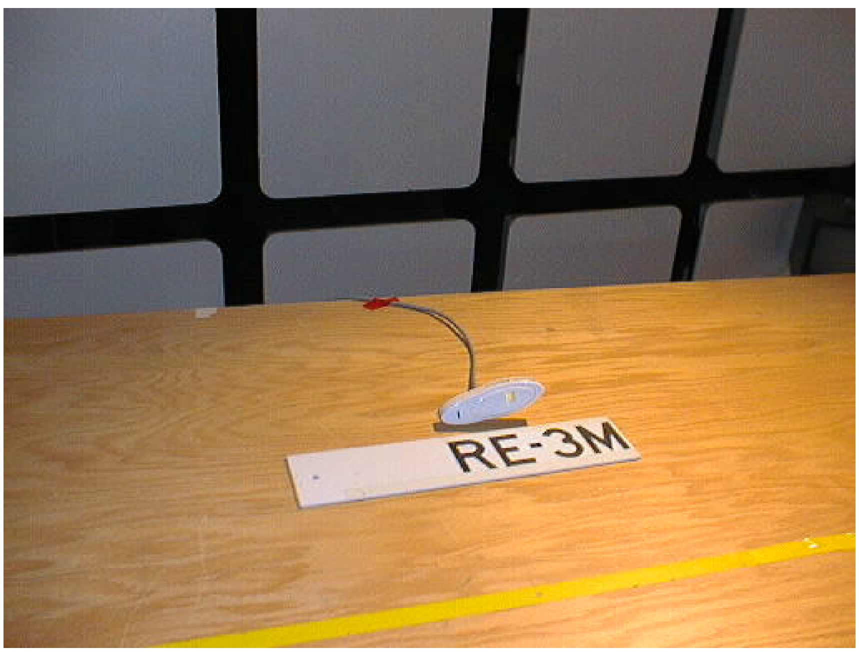


Figure 6.13 - Radiated Emissions, Open Area Test Site (ATS-1190 and 1192)

Figure 6.14 - Radiated Emissions, Open Area Test Site (ATS-1190 and 1192)

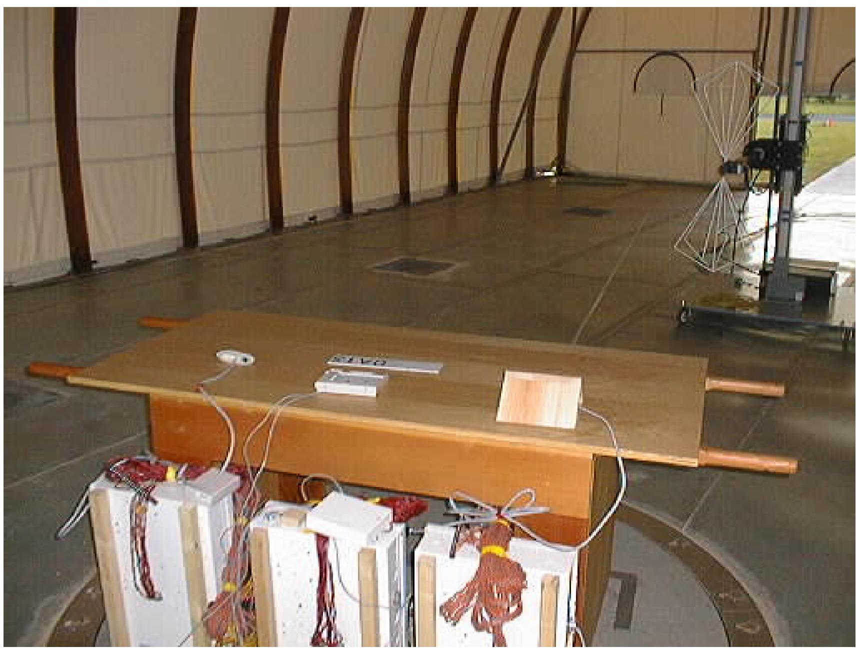


Figure 6.15 - Radiated Emissions, Open Area Test Site (NX1700)

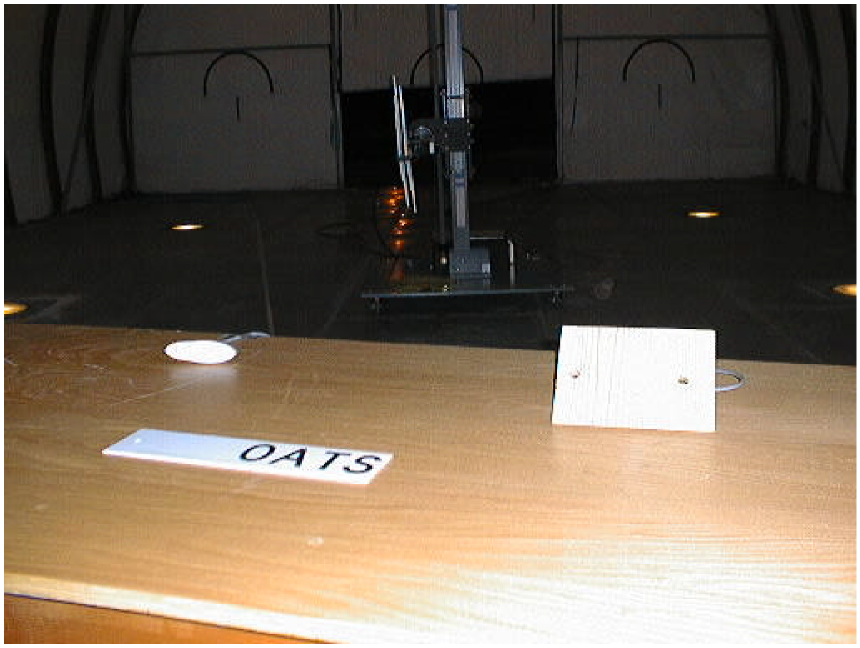


Figure 6.16 - Radiated Emissions, Open Area Test Site (NX1700E)

Figure 6.17 - Modifications To The Device (ATS-1250)

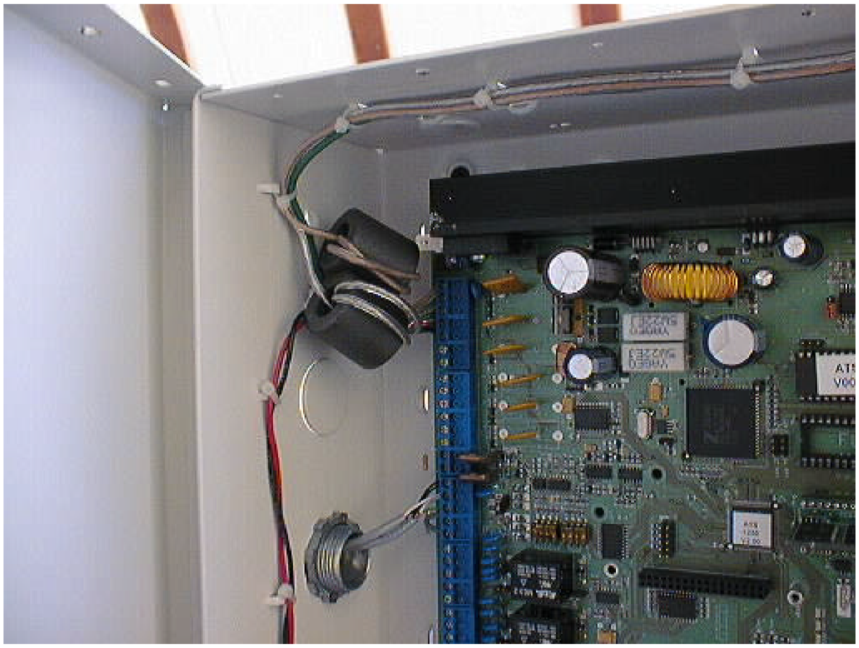


Figure 6.18 - Modifications To The Device (ATS-1250)

Figure 6.19 - Modifications To The Device (ATS-4000)

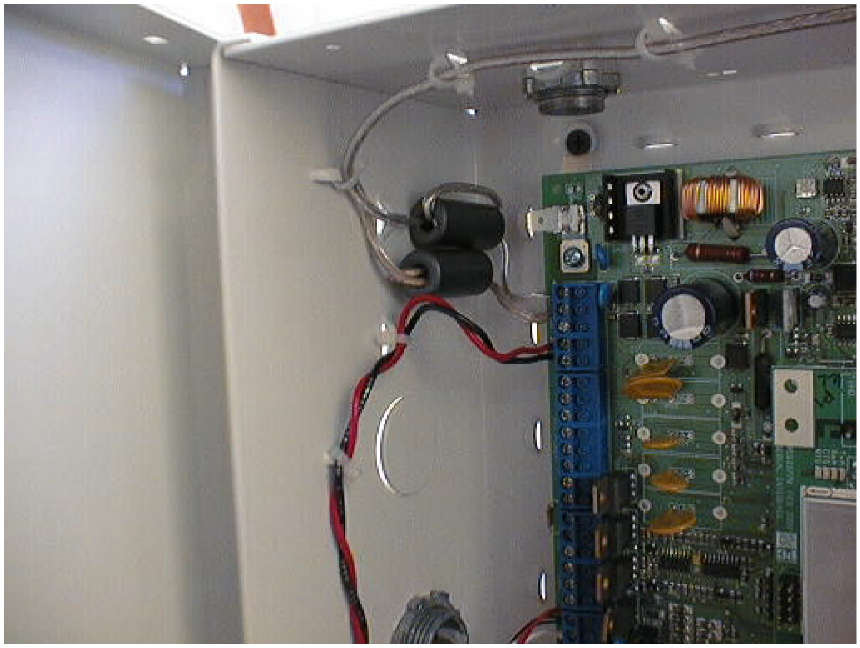


Figure 6.20 - Modifications To The Device (ATS-4000)

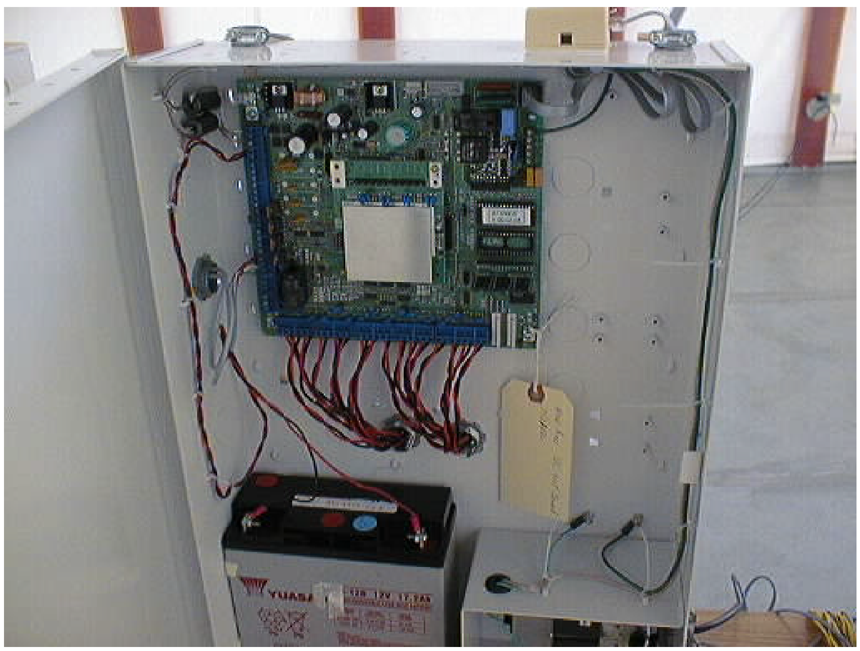
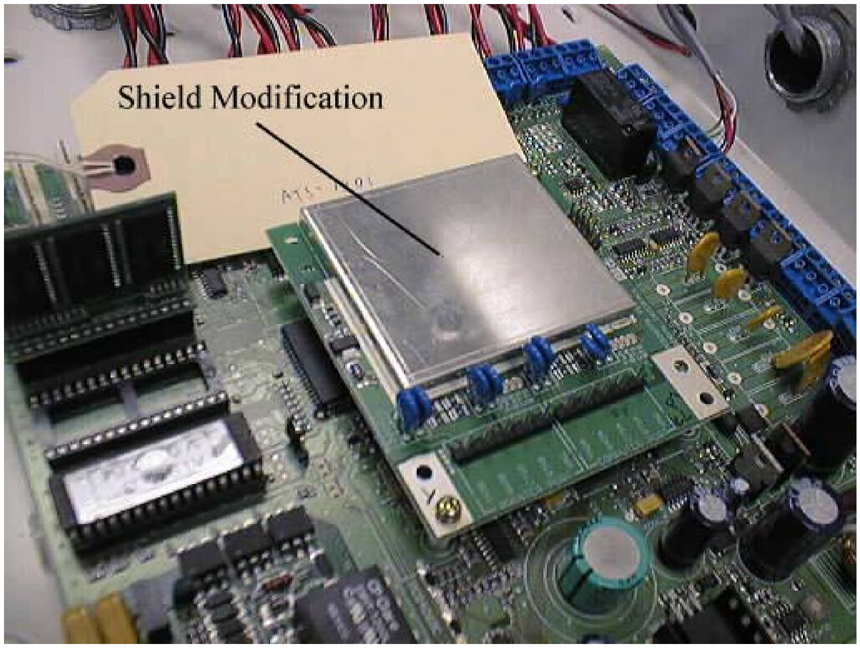


Figure 6.21 - Modifications To The Device (ATS-1801)



7 CONDUCTED EMISSIONS DATA

7.1 Conducted Emissions Test Procedure

This test procedure was performed in accordance with the Conducted Voltage Emissions Test Procedure SOP-0179, in accordance with ANSI C63.4-1992 and FCC Part 15 (2002).

The conducted emissions were measured using two steps:

The initial, qualitative, survey of conducted emissions was performed using a spectrum analyzer scanning with peak detection. For this step, the frequency range was divided into at least six sub-ranges, and a separate scan was taken for each. For each sub-range scan, the spectrum analyzer was swept at least four times in max-hold mode to capture time varying emissions. The scans for each line were plotted and all emissions shown, for which quasi-peak measurements were to be performed, were marked.

The final, quantitative, measurement was made on the configuration and mode of operation that produced the highest emission relative to the limit, on the emissions recorded as "marked traces." These were exported to a spot frequency table, which was used to automatically perform a quasi-peak measurement on each frequency. A 9 kHz bandwidth was used.

The EUT was set to operate with the AC mains on and the transponder (card) not in the field of the sensor (polling mode).

7.2 Conducted Emissions Test Results

The emissions measurements made in this configuration are deemed to represent the worst-case emissions for this system. The preliminary peak scans for each line are provided on the following pages. Emissions requiring quasi-peak measurements are marked numerically. Additional emissions may also be marked.

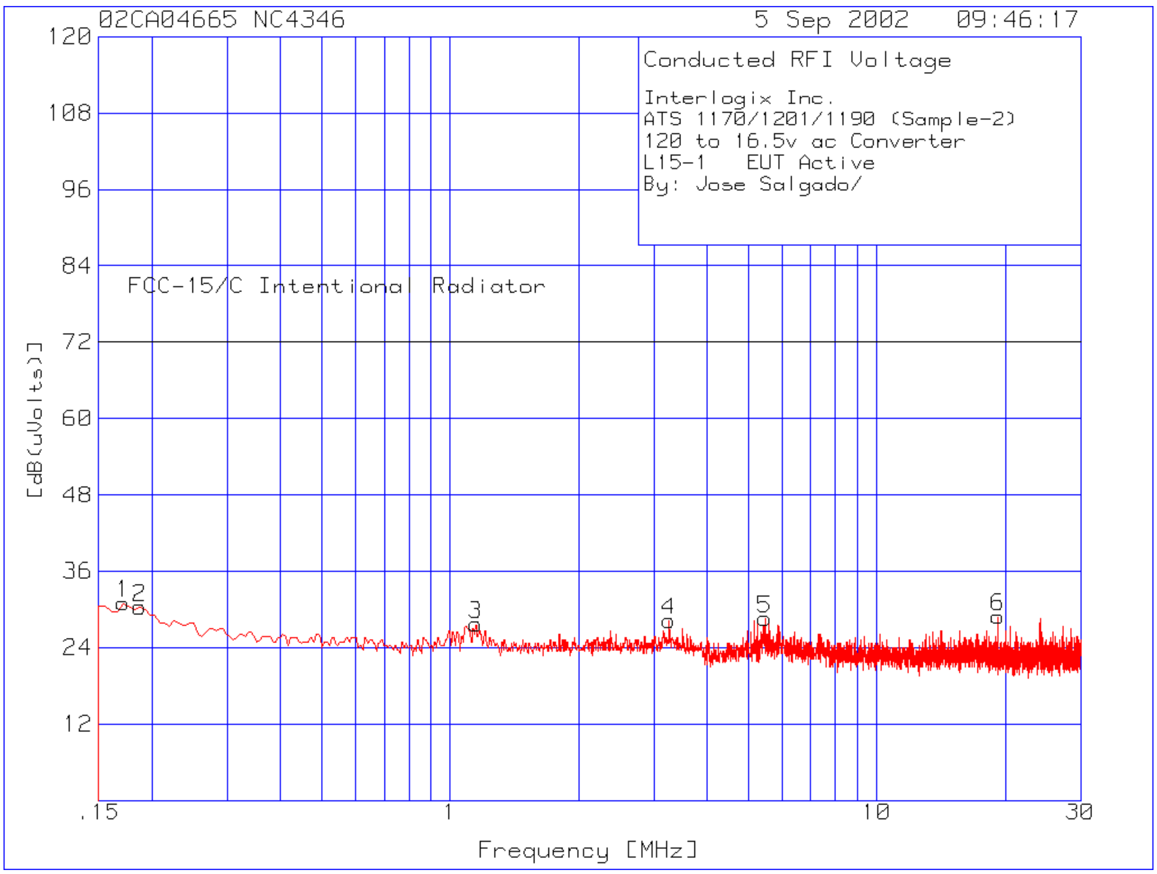
The final quasi-peak compliance data for the lines tested is provided on separate pages following the preliminary peak scans.

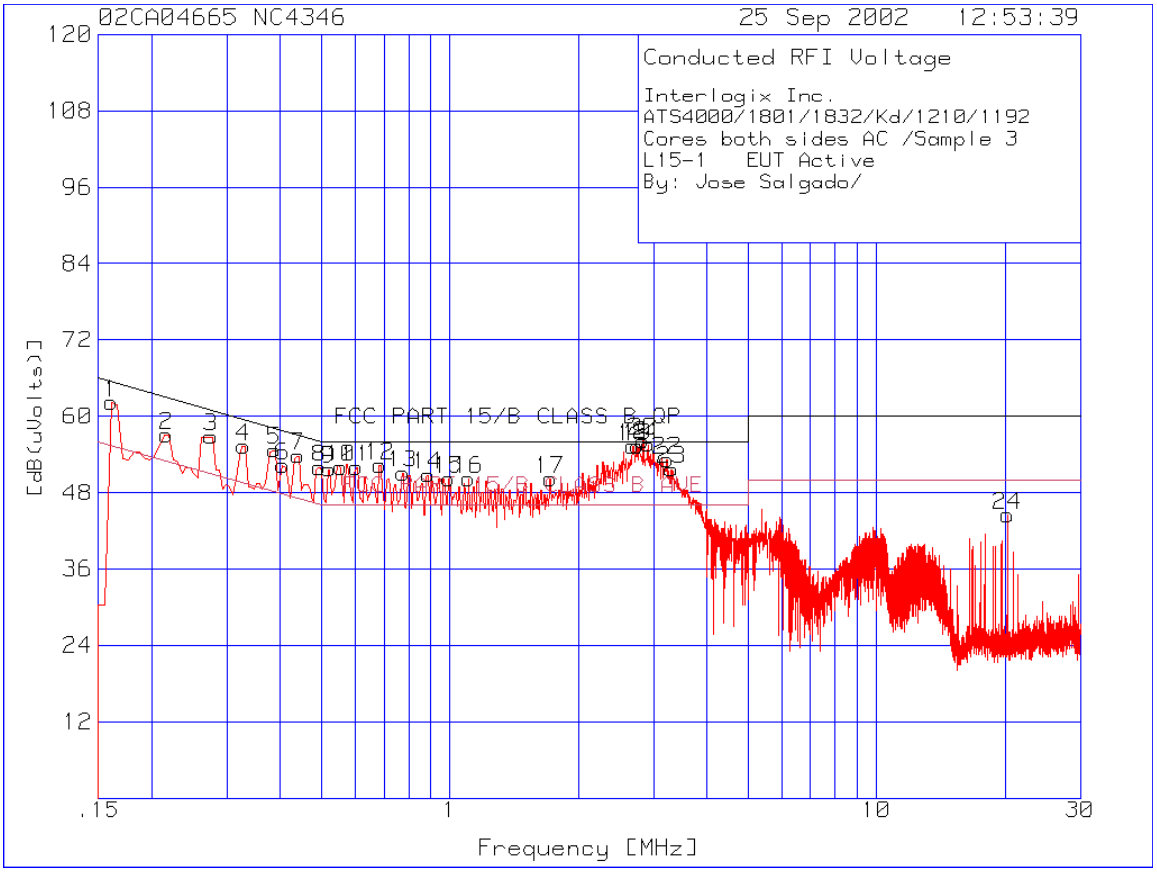
The measurements are in compliance since the quasi peak measurement(s) did not exceed the limit. And the average measurement did not exceed the average limit. The minimum margin between quasi-peak measurement(s) and quasi-peak limit was –33.10 dB(µV/m) at 19.25 MHz for the ATS-1190, -11.05 dB(µV/m) at 0.55 MHz for the ATS-1192. –16.68 dB(µV/m) at 29.99 MHz for the NX-1700E Master/Slave. The minimum margin between average measurement and average limit was -15.37 dB(µV/m) at 0.55 MHz for the ATS-1192

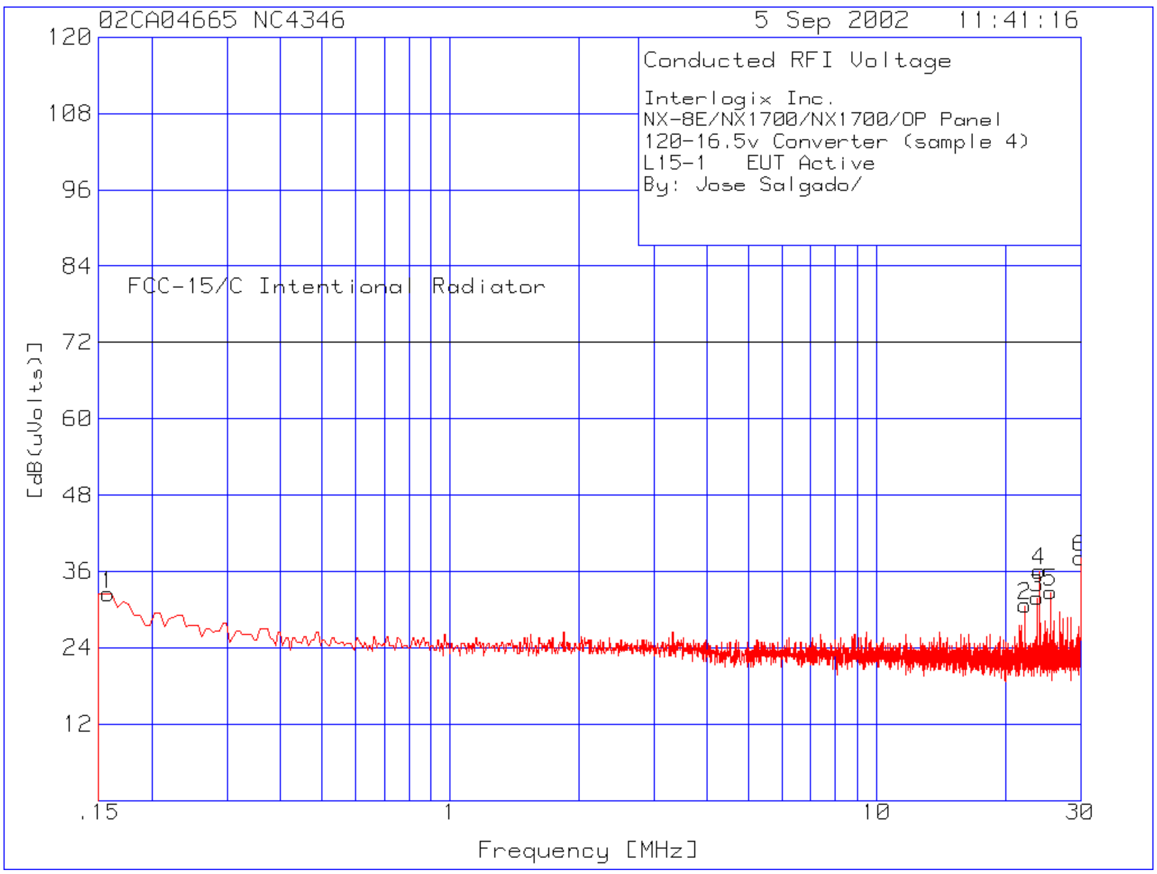
7.3 Conducted Emissions Test Data

Measurement Of Conducted Disturbance Voltage - Scan Line 1

Temp./Humidity/Atm. Pressure	:	22 °C/ 40 %RH/ 29.8 in Hg
Manufacturer	:	GE-Interlogix
Equipment Under Test (EUT)	:	Model ATS-1190, ATS-1192 and NX1700E
Operating Mode	:	AC Mains on
Applied Standard	:	CFR Title 47, Pt. 15 Subpart B/C
Detection Mode	:	Peak (pk)
Bandwidth	:	9 kHz for measurements 150 kHz to 30 MHz
Line	:	L1




02CA04665 NC4346
25 Sep 2002 12:53:39
Conducted RFI Voltage
Interlogix Inc.
ATS4000/1801/1832/Kd/1210/1192
Cores both sides AC /Sample 3
L15-1 EUT Active
By: Jose Salgado/
FCC PART 15/B CLASS B QP
[dB(uVolts)]
Frequency [MHz]


02CA04665 NC4346
5 Sep 2002 11:41:16
Conducted RFI Voltage
Interlogix Inc.
NX-8E/NX1700/NX1700/DP Panel
120-16.5v Converter (sample 4)
L15-1 EUT Active
By: Jose Salgado/
FCC-15/C Intentional Radiator
[dB(uVolts)]
Frequency [MHz]

Measurement Of Conducted Disturbance Voltage - Line 1 Data

Temp./Humidity/Atm. Pressure	**:**	22 °C/ 40 %RH/ 29.8 in Hg
Manufacturer	**:**	GE-Interlogix
Equipment Under Test (EUT)	**:**	Model ATS-1190, ATS-1192 and NX1700E
Operating Mode	**:**	AC Mains on
Applied Standard / Class	**:**	CFR Title 47, Pt. 15 / General Requirements
Detection Mode	**:**	Quasi-peak (qp) or Average (av)
Bandwidth	**:**	9 kHz for measurements 150 kHz to 30 MHz
Line	**:**	L1

ATS-1190

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1
.20581	15.82qp	9.6	1.2	26.62	64.41
			Margin [dB]:		-37.79
.20515	16.17qp	9.6	1.2	26.97	64.42
			Margin [dB]:		-37.45
1.1642	12.57qp	9.5	.1	22.17	56
			Margin [dB]:		-33.83
3.267	12.1qp	9.6	.1	21.8	56
			Margin [dB]:		-34.20
5.4289	12.67qp	9.7	.1	22.47	60
			Margin [dB]:		-37.53
19.252	**17qp**	**9.8**	**.1**	**26.9**	**60**
			Margin [dB]:		**-33.10**

File: CVL11_2QP.TXT
Date: 9/5/02

ATS1192

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2
.16065	36.97qp	9.6	2	48.57	65.4	55.4
			Margin [dB]:		-16.83	-6.83
.21655	34.07qp	9.6	1.1	44.77	63	53
			Margin [dB]:		-18.23	-8.23
.27511	35.35qp	9.5	.9	45.75	61	51
			Margin [dB]:		-15.25	-5.25
.32834	34.3qp	9.6	.7	44.6	59.5	49.5
			Margin [dB]:		-14.9	-4.9
.3869	35.35qp	9.6	.5	45.45	58.1	48.1
			Margin [dB]:		-12.65	-2.65
.40554	31.95qp	9.6	.5	42.05	57.7	47.7
			Margin [dB]:		-15.65	-5.65
.44014	31.32qp	9.6	.4	41.32	57.1	47.1
			Margin [dB]:		-15.78	-5.78
.49338	29.95qp	9.6	.2	39.75	56.1	46.1
			Margin [dB]:		-16.35	-6.35
.52	33.02qp	9.6	.2	42.82	56	46
			Margin [dB]:		-13.18	-3.18
.5546	**35.15qp**	**9.6**	**.2**	**44.95**	**56**	**46**
			Margin [dB]:		**-11.05**	**-1.05**
.60252	30.25qp	9.6	.2	40.05	56	46
			Margin [dB]:		-15.95	-5.95
.68503	32.72qp	9.6	.1	42.42	56	46
			Margin [dB]:		-13.58	-3.58
.77554	30.9qp	9.6	.1	40.6	56	46
			Margin [dB]:		-15.4	-5.4
.88733	32.45qp	9.6	.1	42.15	56	46
			Margin [dB]:		-13.85	-3.85
.99381	28.67qp	9.6	.1	38.37	56	46
			Margin [dB]:		-17.63	-7.63
1.1056	28.3qp	9.6	.1	38	56	46
			Margin [dB]:		-18	-8
1.71783	28.07qp	9.6	.1	37.77	56	46
			Margin [dB]:		-18.23	-8.23
2.6761	33.8qp	9.6	.1	43.5	56	46
			Margin [dB]:		-12.5	-2.5
2.74797	34.3qp	9.6	.1	44	56	46
			Margin [dB]:		-12	-2
2.83581	34.7qp	9.6	.1	44.4	56	46
			Margin [dB]:		-11.6	-1.6
2.91566	34.35qp	9.6	.1	44.05	56	46
			Margin [dB]:		-11.95	-1.95
3.22444	32.52qp	9.6	.1	42.22	56	46
			Margin [dB]:		-13.78	-3.78
3.30429	31.72qp	9.6	.1	41.42	56	46
			Margin [dB]:		-14.58	-4.58
20.247	27.85qp	9.8	.1	37.75	60	50
			Margin [dB]:		-22.25	-12.25

File: Cvl12_3qp.txt
Date: 9/25/02

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2
.16065	24.79av	9.6	2	36.39	65.4	55.4
			Margin [dB]:		-29.01	-19.01
.21655	22.2av	9.6	1.1	32.9	63	53
			Margin [dB]:		-30.1	-20.1
.27511	22.48av	9.5	.9	32.88	61	51
			Margin [dB]:		-28.12	-18.12
.32834	21.51av	9.6	.7	31.81	59.5	49.5
			Margin [dB]:		-27.69	-17.69
.3869	22.54av	9.6	.5	32.64	58.1	48.1
			Margin [dB]:		-25.46	-15.46
.40554	17.67av	9.6	.5	27.77	57.7	47.7
			Margin [dB]:		-29.93	-19.93
.44014	18.27av	9.6	.4	28.27	57.1	47.1
			Margin [dB]:		-28.83	-18.83
.49338	16.78av	9.6	.2	26.58	56.1	46.1
			Margin [dB]:		-29.52	-19.52
.52	18.16av	9.6	.2	27.96	56	46
			Margin [dB]:		-28.04	-18.04
.5546	**20.83av**	**9.6**	**.2**	**30.63**	**56**	**46**
			Margin [dB]:		**-25.37**	**-15.37**
.60252	17.32av	9.6	.2	27.12	56	46
			Margin [dB]:		-28.88	-18.88
.68503	17.48av	9.6	.1	27.18	56	46
			Margin [dB]:		-28.82	-18.82
.77554	18.38av	9.6	.1	28.08	56	46
			Margin [dB]:		-27.92	-17.92
.88733	18.55av	9.6	.1	28.25	56	46
			Margin [dB]:		-27.75	-17.75
.99381	16.88av	9.6	.1	26.58	56	46
			Margin [dB]:		-29.42	-19.42
1.1056	15.97av	9.6	.1	25.67	56	46
			Margin [dB]:		-30.33	-20.33
1.71783	15.23av	9.6	.1	24.93	56	46
			Margin [dB]:		-31.07	-21.07
2.6761	17.08av	9.6	.1	26.78	56	46
			Margin [dB]:		-29.22	-19.22
2.74797	17.34av	9.6	.1	27.04	56	46
			Margin [dB]:		-28.96	-18.96
2.83581	17.31av	9.6	.1	27.01	56	46
			Margin [dB]:		-28.99	-18.99
2.91566	18.13av	9.6	.1	27.83	56	46
			Margin [dB]:		-28.17	-18.17
3.22444	15.62av	9.6	.1	25.32	56	46
			Margin [dB]:		-30.68	-20.68
3.30429	15.33av	9.6	.1	25.03	56	46
			Margin [dB]:		-30.97	-20.97
20.24698	16.34av	9.8	.1	26.24	60	50
			Margin [dB]:		-33.76	-23.76

LIMIT 1: FCC PART 15/B CLASS B QP
LIMIT 2: FCC PART 15/B CLASS B AVE
File: Cvl12_3av.txt
Date: 9/25/02

NX1700E

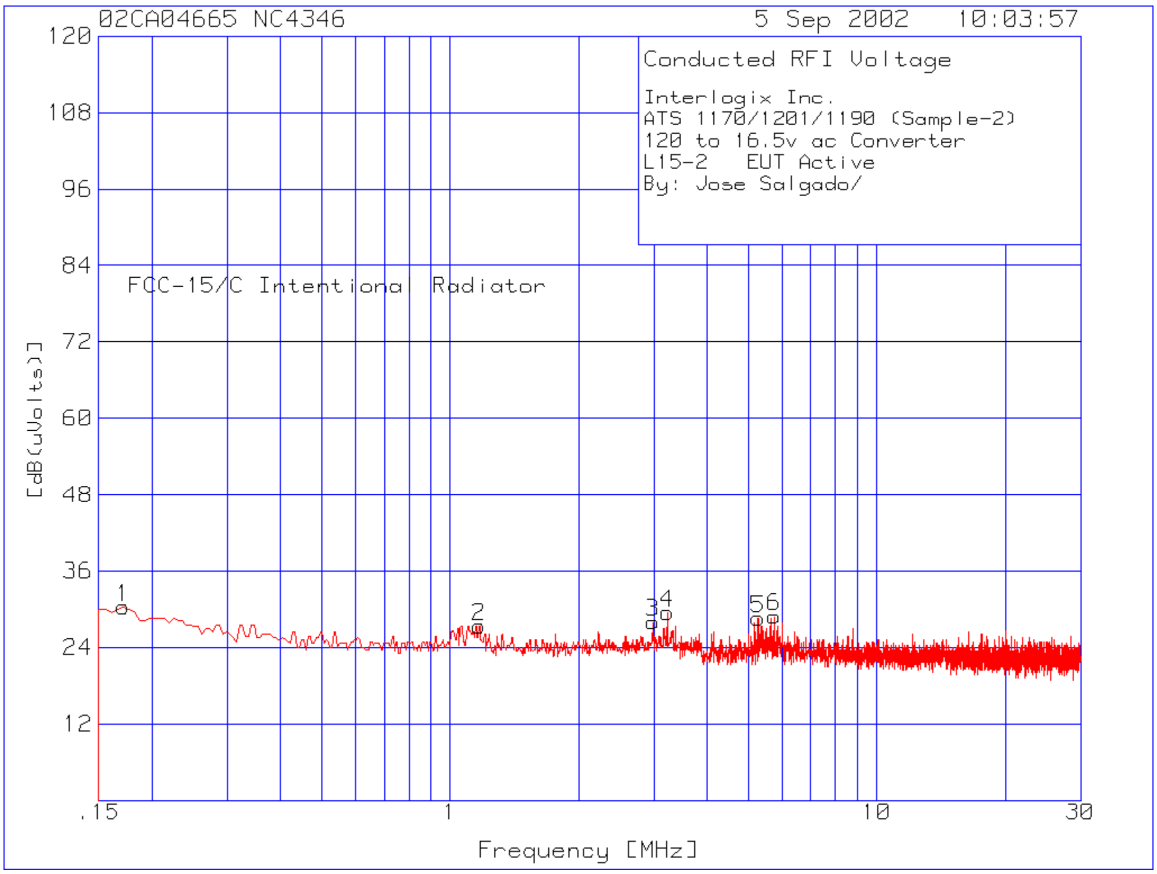
Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1
.20616	15.6qp	9.6	1.2	26.4	64.40
			Margin [dB]:		-38.00
22.2506	18qp	9.9	.1	28	60
			Margin [dB]:		-32.00
23.7525	20.2qp	9.9	.1	30.2	60
			Margin [dB]:		-29.80
24.0026	26.02qp	9.9	.1	36.02	60
			Margin [dB]:		-23.98
25.5031	22.4qp	9.9	.1	32.4	60
			Margin [dB]:		-27.60
29.9021	12.15qp	9.9	.1	22.15	60
			Margin [dB]:		-37.85

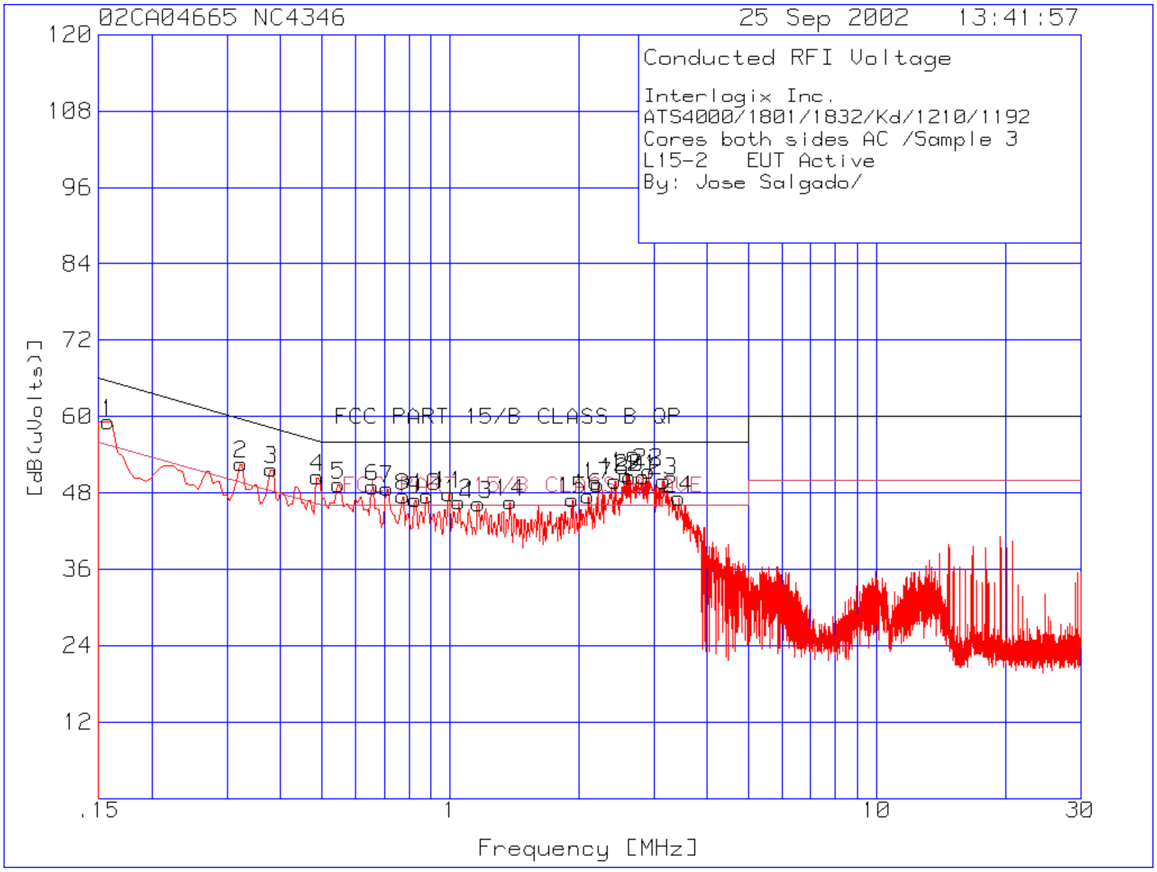
File: CVL11_4QP.TXT
Date: 9/5/02

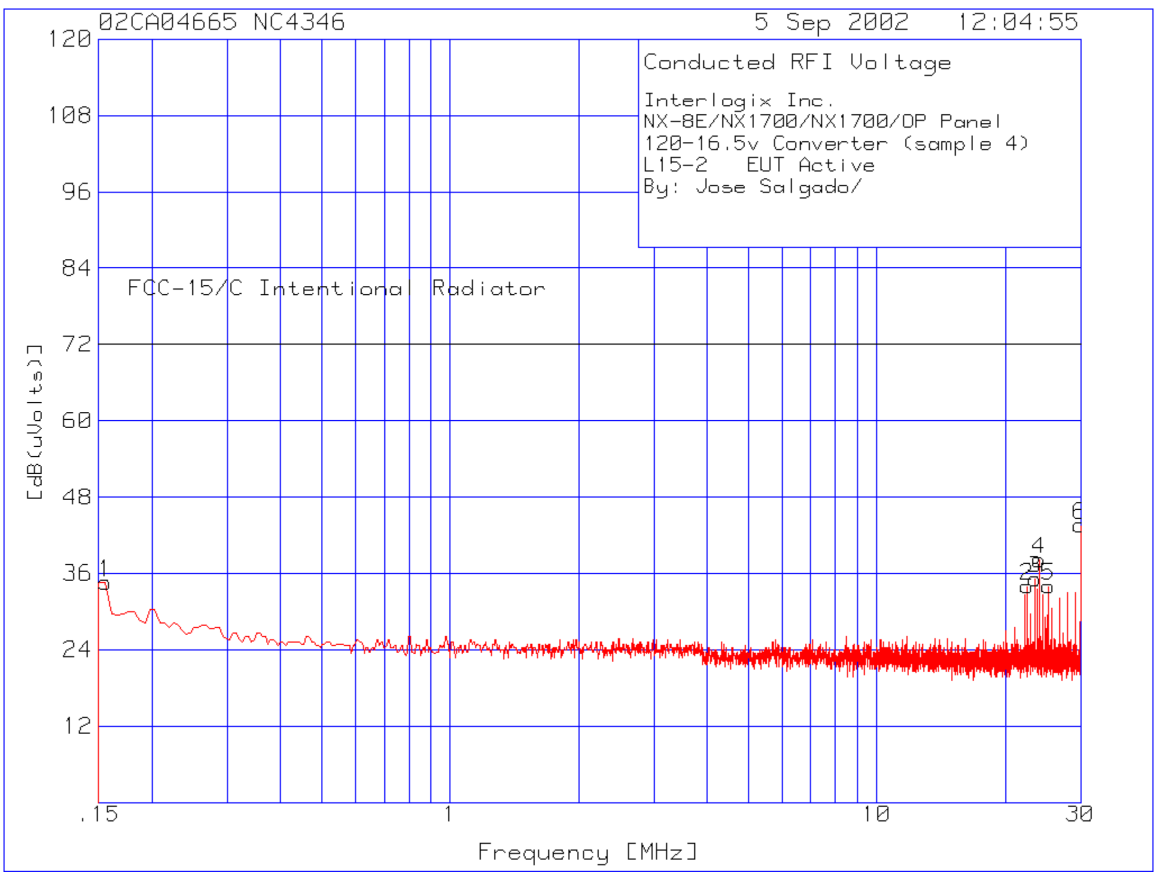
Tested By:
Jose Salgado

Measurement Of Conducted Disturbance Voltage - Scan Line 2 (N)

Temp./Humidity/Atm. Pressure	:	22 °C/ 40 %RH/ 29.8 in Hg
Manufacturer	:	GE-Interlogix
Equipment Under Test (EUT)	:	Model ATS-1190, ATS-1192 and NX1700E
Operating Mode	:	AC Mains on
Applied Standard / Class	:	CFR Title 47, Pt. 15 / General Requirements
Detection Mode	:	Peak (pk)
Bandwidth	:	9 kHz for measurements 150 kHz to 30 MHz
Line	:	LN




02CA04665 NC4346
25 Sep 2002 13:41:57
Conducted RFI Voltage
Interlogix Inc.
ATS4000/1801/1832/Kd/1210/1192
Cores both sides AC /Sample 3
L15-2 EUT Active
By: Jose Salgado/
FCC PART 15/B CLASS B QP
120
108
96
84
72
60
48
36
24
12
[dB(uVolts)]
.15
1
10
30
Frequency [MHz]


02CA04665 NC4346
5 Sep 2002 12:04:55
Conducted RFI Voltage
Interlogix Inc.
NX-8E/NX1700/NX1700/OP Panel
120-16.5v Converter (sample 4)
L15-2 EUT Active
By: Jose Salgado/
FCC-15/C Intentional Radiator
120
108
96
84
72
60
48
36
24
12
[dB(uVolts)]
.15
1
10
30
Frequency [MHz]

Measurement Of Conducted Disturbance Voltage - Line 2 (N) Data

Temp./Humidity/Atm. Pressure	:	22 °C/ 40 %RH/ 29.8 in Hg
Manufacturer	:	GE-Interlogix
Equipment Under Test (EUT)	:	Model ATS-1190, ATS-1192 and NX1700E
Operating Mode	:	AC Mains on
Applied Standard / Class	:	CFR Title 47, Pt. 15 / General Requirements
Detection Mode	:	Quasi-peak (qp) or Average (av)
Bandwidth	:	9 kHz for measurements 150 kHz to 30 MHz
Line	:	LN

ATS 1190

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1
.20616	15.32qp	9.6	1.2	26.12	64.4
			Margin [dB]:		-38.28
1.1274	12.35qp	9.6	.1	22.05	56
			Margin [dB]:		-33.95
3.021	12.15qp	9.6	.1	21.85	56
			Margin [dB]:		-34.15
3.1791	12.12qp	9.6	.1	21.82	56
			Margin [dB]:		-34.18
5.27	17.07qp	9.6	.1	26.77	60
			Margin [dB]:		-33.23
5.7623	12.82qp	9.6	.1	22.52	60
			Margin [dB]:		-37.48

File: CVL21_2QP.TXT
Date: 9/5/02

ATS1192

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2
.15799	36.82qp	9.6	2	48.42	65.6	55.6
			Margin [dB]:		-17.18	-7.18
.32302	33.77qp	9.6	.7	44.07	59.6	49.6
			Margin [dB]:		-15.53	-5.53
.38158	31.9qp	9.6	.6	42.1	58.2	48.2
			Margin [dB]:		-16.1	-6.1
.48806	30.87qp	9.6	.2	40.67	56.2	46.2
			Margin [dB]:		-15.53	-5.53
.54662	29.8qp	9.6	.2	39.6	56	46
			Margin [dB]:		-16.4	-6.4
.65841	30.7qp	9.6	.1	40.4	56	46
			Margin [dB]:		-15.6	-5.6
.71165	29.92qp	9.6	.1	39.62	56	46
			Margin [dB]:		-16.38	-6.38
.77554	30.65qp	9.6	.1	40.35	56	46
			Margin [dB]:		-15.65	-5.65
.82877	29.1qp	9.6	.1	38.8	56	46
			Margin [dB]:		-17.2	-7.2
.88201	28.05qp	9.6	.1	37.75	56	46
			Margin [dB]:		-18.25	-8.25
.99381	28.37qp	9.6	.1	38.07	56	46
			Margin [dB]:		-17.93	-7.93
1.04704	28.22qp	9.5	.1	37.82	56	46
			Margin [dB]:		-18.18	-8.18
1.16417	30qp	9.5	.1	39.6	56	46
			Margin [dB]:		-16.4	-6.4
1.38244	27qp	9.6	.1	36.7	56	46
			Margin [dB]:		-19.3	-9.3
1.9361	27.27qp	9.6	.1	36.97	56	46
			Margin [dB]:		-19.03	-9.03
2.10646	28.75qp	9.6	.1	38.45	56	46
			Margin [dB]:		-17.55	-7.55
2.21826	30.47qp	9.6	.1	40.17	56	46
			Margin [dB]:		-15.83	-5.83
2.43653	30.4qp	9.6	.1	40.1	56	46
			Margin [dB]:		-15.9	-5.9
2.58027	32.47qp	9.6	.1	42.17	56	46
			Margin [dB]:		-13.83	-3.83
2.63351	32.42qp	9.6	.1	42.12	56	46
			Margin [dB]:		-13.88	-3.88
2.83315	34.27qp	9.6	.1	43.97	56	46
			Margin [dB]:		-12.03	-2.03
2.92099	33.87qp	9.6	.1	43.57	56	46
			Margin [dB]:		-12.43	-2.43
3.16588	31.82qp	9.6	.1	41.52	56	46
			Margin [dB]:		-14.48	-4.48
3.43206	28.2qp	9.6	.1	37.9	56	46
			Margin [dB]:		-18.1	-8.1

File: Cvl22_3qp.txt
Date: 9/25/02

ATS1192

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2
.15799	24.04av	9.6	2	35.64	65.6	55.6
			Margin [dB]:		-29.96	-19.96
.32302	20.85av	9.6	.7	31.15	59.6	49.6
			Margin [dB]:		-28.45	-18.45
.38158	17.09av	9.6	.6	27.29	58.2	48.2
			Margin [dB]:		-30.91	-20.91
.48806	20.28av	9.6	.2	30.08	56.2	46.2
			Margin [dB]:		-26.12	-16.12
.54662	16.92av	9.6	.2	26.72	56	46
			Margin [dB]:		-29.28	-19.28
.65841	17.07av	9.6	.1	26.77	56	46
			Margin [dB]:		-29.23	-19.23
.71165	17.39av	9.6	.1	27.09	56	46
			Margin [dB]:		-28.91	-18.91
.77554	18.38av	9.6	.1	28.08	56	46
			Margin [dB]:		-27.92	-17.92
.82877	16.01av	9.6	.1	25.71	56	46
			Margin [dB]:		-30.29	-20.29
.88201	15.41av	9.6	.1	25.11	56	46
			Margin [dB]:		-30.89	-20.89
.99381	15.61av	9.6	.1	25.31	56	46
			Margin [dB]:		-30.69	-20.69
1.04704	15.32av	9.5	.1	24.92	56	46
			Margin [dB]:		-31.08	-21.08
1.16417	17.08av	9.5	.1	26.68	56	46
			Margin [dB]:		-29.32	-19.32
1.38244	13.54av	9.6	.1	23.24	56	46
			Margin [dB]:		-32.76	-22.76
1.9361	14.82av	9.6	.1	24.52	56	46
			Margin [dB]:		-31.48	-21.48
2.10646	14.11av	9.6	.1	23.81	56	46
			Margin [dB]:		-32.19	-22.19
2.21826	13.88av	9.6	.1	23.58	56	46
			Margin [dB]:		-32.42	-22.42
2.43653	13.67av	9.6	.1	23.37	56	46
			Margin [dB]:		-32.63	-22.63
2.58027	16.33av	9.6	.1	26.03	56	46
			Margin [dB]:		-29.97	-19.97
2.63351	14.3av	9.6	.1	24	56	46
			Margin [dB]:		-32	-22
2.83315	16.79av	9.6	.1	26.49	56	46
			Margin [dB]:		-29.51	-19.51
2.92099	15.7av	9.6	.1	25.4	56	46
			Margin [dB]:		-30.6	-20.6
3.16588	14.32av	9.6	.1	24.02	56	46
			Margin [dB]:		-31.98	-21.98
3.43206	13.54av	9.6	.1	23.24	56	46
			Margin [dB]:		-32.76	-22.76

LIMIT 1: FCC PART 15/B CLASS B QP
LIMIT 2: FCC PART 15/B CLASS B AVE

File: Cvl22_3av.txt
Date: 9/25/02

NX1700E

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1
.20531	15.97qp	9.6	1.2	26.77	64.42
			Margin [dB]:		-37.65
22.5027	22.62qp	9.9	.1	32.62	60
			Margin [dB]:		-27.38
23.5028	22.5qp	9.9	.1	32.5	60
			Margin [dB]:		-27.50
24.0012	28.27qp	9.9	.1	38.27	60
			Margin [dB]:		-21.73
25.2527	23.3qp	9.9	.1	33.3	60
			Margin [dB]:		-26.70
29.9998	**33.32qp**	**9.9**	**.1**	**43.32**	**60**
			Margin [dB]:		**-16.68**

File: CVL21_4QP.TXT
Date: 9/5/02

Tested By:
Jose Salgado

8 RADIATED EMISSIONS DATA

8.1 Radiated Emissions Test Procedure

This test procedure was conducted in accordance with the Radiated Emissions Test Procedure SOP-0152, in accordance with ANSI C63.4-1992 or FCC Part 15 (2002).

The radiated emissions were measured using two steps:

Preliminary measurements were performed with a spectrum analyzer scanning with peak detection and the appropriate receiver bandwidths for the frequency ranges covered. These initial, qualitative, surveys of emissions were performed in a shielded semi-anechoic chamber. For this step, the frequency range was divided into several sub-ranges, and a separate scan was taken for each. These measurements were performed for the horizontal and vertical receiving antenna polarities. Measurements were made while the EUT was rotated about it's vertical axis through a 360 degree azimuth, each frequency range was continuously swept, and the maximum emission levels recorded.

The scans for each polarity and frequency range were plotted and EUT signals shown as near or higher than the limit were marked.

The final, quantitative, measurement was made in an open area test site at a 3-meter distance on each of the emissions recorded as "marked traces." These detected emissions were individually maximized by rotating the EUT about it's vertical axis through a 360 degree azimuth and varying the height of the receiving antenna from 1 to 4 m in both the horizontal and vertical polarities.

For all pre-scans the EUT was set to operate with the AC mains on and the transponder (card) not in the field of the sensor (polling mode), and also with the transponder in the field of the sensor (continual reading mode), to determine the worst-case emissions operating mode. Compliance measurements were made in continual reading mode below 30 MHz and in polling mode above 30 MHz.

8.2 Field Strength Calculations

7.2.1 The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain, if any, from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG, \text{ where}$$

FS = Field Strength	RA = Receiver Amplitude
AF = Antenna Factor	CF = Cable Attenuation Factor
AG = Amplifier Gain	

Assume a logarithmic reading of 52.5 dB(µV) is obtained. The Antenna Factor of 7.4 and a Cable Factor of 1.1 is added. The Amplifier Gain of 29 dB is subtracted, giving a field strength of 32 dB(µV)/m. The 32 dB(µV)/m was mathematically converted to it's corresponding linear level in µV/m:

$$FS = 52.5 + 7.4 + 1.1 - 29 = 32 \text{ dB}(\mu V)/m$$

Level in µV/m = Common Antilogarithm [(32 dB(µV)/m)/20] = 39.8 µV/m

8.3 Radiated Emissions Test Results

The emissions measurements made in this configuration represent the worst-case emissions for this system. The preliminary peak scans for each frequency span and antenna orientation are provided on the following pages. Emissions requiring quasi-peak measurements are marked numerically. Other emissions may also be marked.

Measurements were started from 100 kHz as per FCC part 15 subpart C section 15.33 (a).

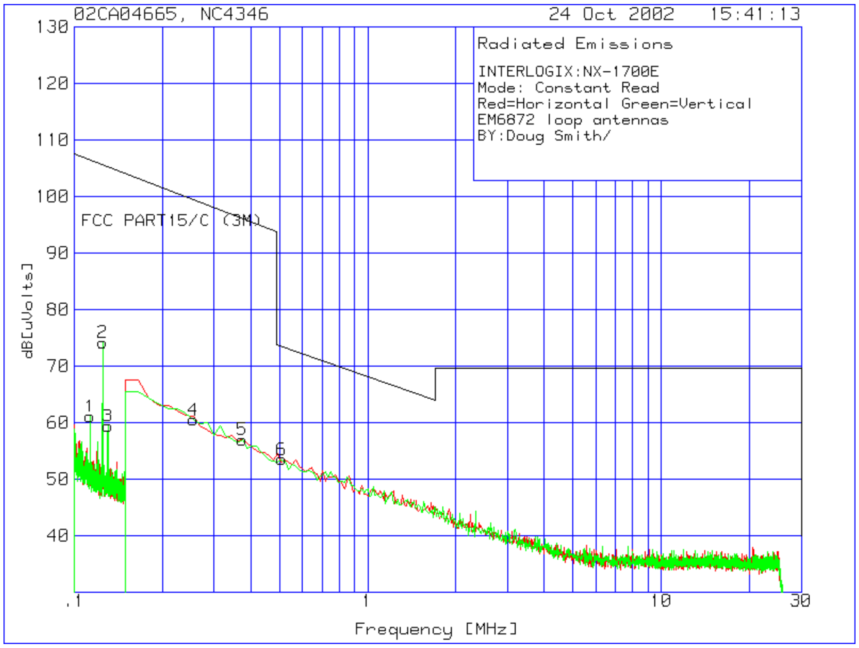
The final quasi-peak or average compliance data for each marked trace frequency that was found to be the EUT, is provided on separate pages following the preliminary peak scans.

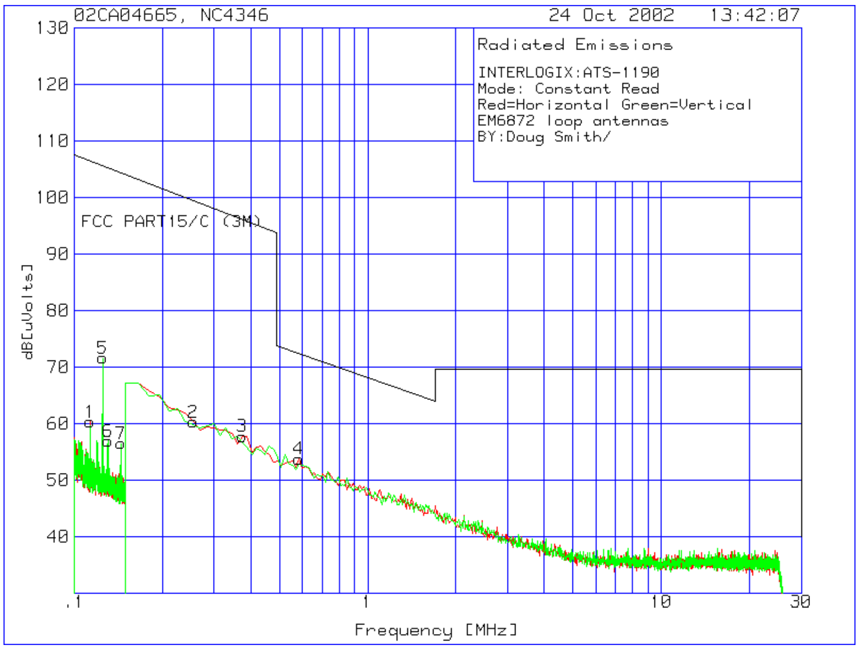
The measurements are in compliance since the quasi peak measurement(s) did not exceed the limit. The minimum margin between quasi-peak measurement and General Requirements limit was –8.55 dB(μV/m) at 47.46 MHz for the ATS-1190, -4.99 dB(μV/m) at 180.85 MHz for the ATS-1192. –9.7 dB(μV/m) at 46.72 MHz for the NX-1700E Master/Slave.

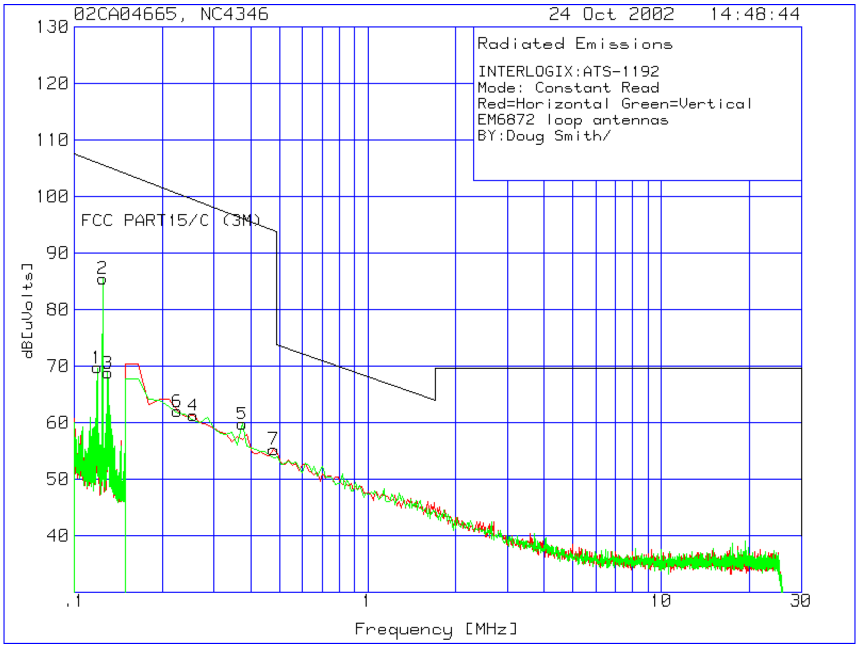
8.4 Radiated Emissions Test Data

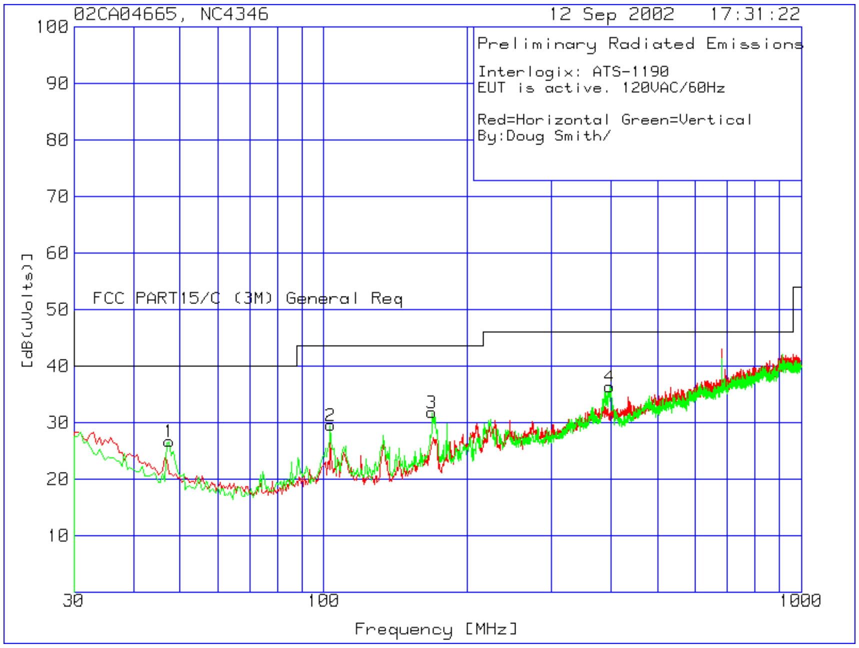
Measurement Of Radiated Emissions - Electric Field Precompliance, 3m Chamber Scan

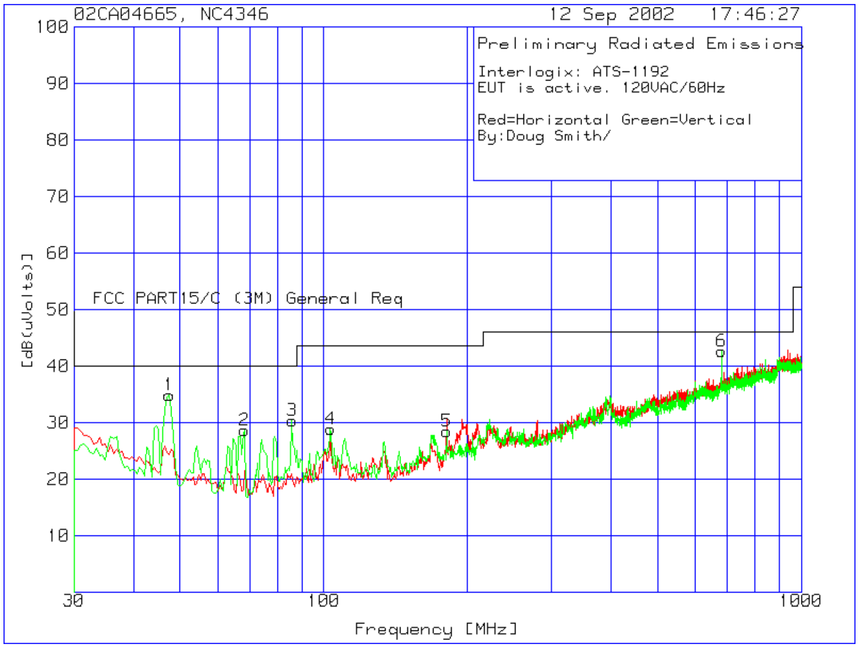
Temp./Humidity/Atm. Pressure	:	22 °C/ 40 %RH/ 29.8 in Hg
Manufacturer	:	GE-Interlogix
Equipment Under Test (EUT)	:	Model ATS-1190, ATS- 1192 and NX-1700E
Operating Mode	:	AC Mains on
Applied Standard/Class	:	CFR Title 47, PT. 15 / General Requirements
Detection Mode	:	Peak (pk)
Bandwidth	:	CISPR
Measurement Distance	:	3 meters.

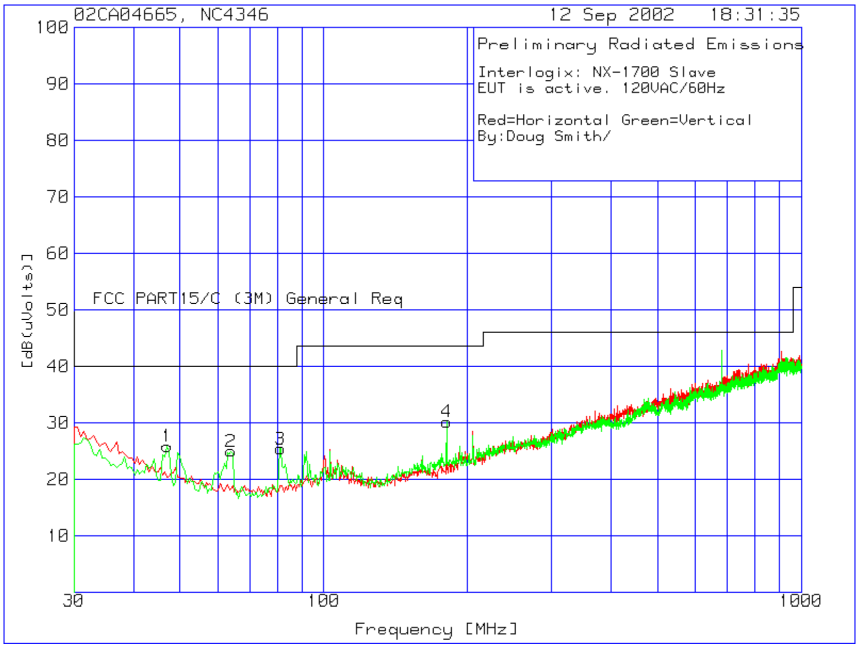


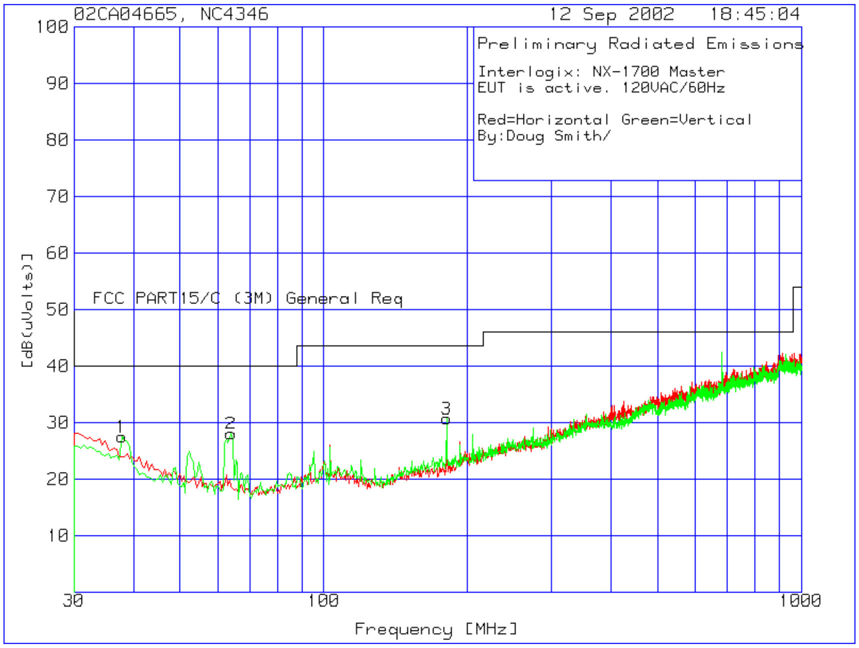



02CA04665, NC4346
24 Oct 2002 14:48:44
Radiated Emissions
INTERLOGIX:ATS-1192
Mode: Constant Read
Red=Horizontal Green=Vertical
EM6872 loop antennas
BY:Doug Smith/
FCC PART15/C (3M)
dB[uVolts]
Frequency [MHz]


02CA04665, NC4346
12 Sep 2002 17:31:22
Preliminary Radiated Emissions
Interlogix: ATS-1190
EUT is active. 120VAC/60Hz
Red=Horizontal Green=Vertical
By:Doug Smith/
FCC PART15/C (3M) General Req
[dB(uVolts)]
Frequency [MHz]


02CA04665, NC4346
12 Sep 2002 17:46:27
Preliminary Radiated Emissions
Interlogix: ATS-1192
EUT is active. 120VAC/60Hz
Red=Horizontal Green=Vertical
By:Doug Smith/
FCC PART15/C (3M) General Req
[dB(uVolts)]
Frequency [MHz]
100
90
80
70
60
50
40
30
20
10
30
100
1000


02CA04665, NC4346
12 Sep 2002 18:31:35
Preliminary Radiated Emissions
Interlogix: NX-1700 Slave
EUT is active. 120VAC/60Hz
Red=Horizontal Green=Vertical
By:Doug Smith/
FCC PART15/C (3M) General Req
[dB(uVolts)]
Frequency [MHz]
100
90
80
70
60
50
40
30
20
10
30
100
1000


02CA04665, NC4346
12 Sep 2002 18:45:04
Preliminary Radiated Emissions
Interlogix: NX-1700 Master
EUT is active. 120VAC/60Hz
Red=Horizontal Green=Vertical
By:Doug Smith/
FCC PART15/C (3M) General Req
[dB(uVolts)]
100
90
80
70
60
50
40
30
20
10
1
2
3
30
100
1000
Frequency [MHz]

Temp./Humidity/Atm. Pressure	:	22 °C/ 40 %RH/ 29.8 in Hg
Manufacturer	:	GE-Interlogix
Equipment Under Test (EUT)	:	Model ATS-1190, ATS- 1192 and NX-1700E
Operating Mode	:	AC Mains on
Applied Standard/Class	:	CFR Title 47, PT. 15 / General Requirements
Detection Mode	:	Quasi-peak (qp) or Peak (pk) or Average (av)
Bandwidth	:	CISPR
OATS Measurement Distance	:	3 meters.

```
 NX-1700E
 Mode: Constant Read
  Test     Meter     Gain/Loss  Transducer  Level  Limit:1
Frequency  Reading    Factor     Factor  dB[uVolts]
 [MHz]     [dB(uV)]    [dB]       [dB]
==============================================================
.1102      -8.13 av      -.03      64.97     56.81   106.76
Azimuth: 181  Height:0 Horz           Margin [dB]:   -49.95

.125       5.47 av       -.02      64.2      69.65   105.67
Azimuth: 36   Height:0 Horz           Margin [dB]:   -36.02

.1302      -16.48 av     -.02      63.93     47.43   105.31
Azimuth: 0    Height:0 Horz           Margin [dB]:   -57.88

.2459      .18 qp        -.01      58.79     58.96   99.79
Azimuth: 123  Height:0 Horz           Margin [dB]:   -40.83

.3747      -2.08 qp      .01       55.13     53.06   96.13
Azimuth: 0    Height:0 Horz           Margin [dB]:   -43.07

.5         -.12 qp       .03       52.3      52.21   73.64
Azimuth: 0    Height:0 Horz           Margin [dB]:   -21.43

File: re3m1_1qpAv.txt
Date: 10/24/02
```

ATS-1190
Mode: Constant Read

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit:1
.1131	-2.49 av	-.03	64.82	62.3	106.53
Azimuth: 11	Height:0 Horz		Margin [dB]:		-44.23
.25	-.29 qp	-.01	58.65	58.35	99.65
Azimuth: 11	Height:0 Horz		Margin [dB]:		-41.3
.375	-2.17 qp	.01	55.13	52.97	96.12
Azimuth: 133	Height:0 Horz		Margin [dB]:		-43.15
.5	-2.1 qp	.03	52.3	50.23	73.64
Azimuth: 133	Height:0 Horz		Margin [dB]:		-23.41
.125	8.18 av	-.02	64.2	72.36	105.67
Azimuth: 264	Height:0 Horz		Margin [dB]:		-33.31
.1302	-8 av	-.02	63.93	55.91	105.32
Azimuth: 264	Height:0 Horz		Margin [dB]:		-49.41
.1446	-8.38 av	-.02	63.18	54.78	104.4
Azimuth: 274	Height:0 Horz		Margin [dB]:		-49.62

File: RE3MqpAv.txt
Date: 10/24/02

ATS-1192
Mode: Constant Read

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit:1
.1199	.57 av	-.02	64.47	65.02	106.03
Azimuth: 266 Height:0 Horz			Margin [dB]:		-41.01
.125	19.23 av	-.02	64.2	83.41	105.67
Azimuth: 33 Height:0 Horz			Margin [dB]:		-22.26
.1302	2.84 av	-.02	63.93	66.75	105.31
Azimuth: 88 Height:0 Horz			Margin [dB]:		-38.56
.2446	.37 qp	-.01	58.83	59.19	99.84
Azimuth: 202 Height:0 Horz			Margin [dB]:		-40.65
.2487	0 qp	-.01	58.69	58.68	99.69
Azimuth: 281 Height:0 Horz			Margin [dB]:		-41.01
.375	1.66 qp	.01	55.13	56.8	96.12
Azimuth: 71 Height:0 Horz			Margin [dB]:		-39.32
.4841	-2.58 qp	.03	52.65	50.1	93.9
Azimuth: 202 Height:0 Horz			Margin [dB]:		-43.8

File: RE3M1_3qpAv.txt
Date: 10/24/02

ATS1190

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1
47.4605	**19.73 qp**	**1.32**	**10.4**	**31.45**	**40**
Azimuth: 117	**Height:102 Vert**		**Margin [dB]:**		**-8.55**
168.6213	7.37 qp	2.58	16.3	26.25	43.5
Azimuth: 8	Height:102 Vert		Margin [dB]:		-17.25
396.9798	16.96 qp	4.12	16	37.08	46.02
Azimuth: 23	Height:100 Vert		Margin [dB]:		-8.94

File: OATS1_1.txt
Date: 9/12/02

ATS1192

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1
47.4786	20.81 qp	1.32	10.4	32.53	40
Azimuth: 114	Height:104 Vert		Margin [dB]:		-7.47
68.3	18.67 qp	1.56	5.3	25.53	40
Azimuth: 360	Height:135 Vert		Margin [dB]:		-14.47
85.74	21.93 qp	1.76	9.13	32.82	40
Azimuth: 279	Height:112 Vert		Margin [dB]:		-7.18
180.8553	**19.45 qp**	**2.66**	**16.4**	**38.51**	**43.5**
Azimuth: 274	**Height:100 Vert**		**Margin [dB]:**		**-4.99**

File: OATS1_2.txt
Date: 9/12/02

NX1700E Slave

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1
46.7238	17.07 qp	1.31	10.56	28.94	40
Azimuth: 59	Height:100 Vert		Margin [dB]:		-11.06
63.9946	18.81 qp	1.45	5.8	26.06	40
Azimuth: 20	Height:110 Vert		Margin [dB]:		-13.94
81.1	17.51 qp	1.7	7.77	26.98	40
Azimuth: 28	Height:135 Vert		Margin [dB]:		-13.02

File: OATS1_4.txt
Date: 9/12/02

NX1700E Master

```
  Test     Meter     Gain/Loss  Transducer  Level  Limit:1
Frequency  Reading   Factor     Factor  [dB(uVolts)]
 [MHz]     [dB(uV)]   [dB]       [dB]
===========================================================
```

37.9408   15.1 qp   1.15   14.05   30.3   40
Azimuth: 356 Height:100 Vert   Margin [dB]:   -9.7

64   21.4 qp   1.45   5.8   28.65   40
Azimuth: 231 Height:100 Vert   Margin [dB]:   -11.35

File: OATS1_5.txt
Date: 9/12/02

Measurement Of Frequency Stability

Temp./Humidity/Atm. Pressure : 22 °C/ 40 %RH/ 29.8 in Hg
Manufacturer : GE-Interlogix
Equipment Under Test (EUT) : Model ATS-1190, ATS- 1192 and NX1700E card readers.
Operating Mode : AC Mains on
Applied Standard/Class : CFR Title 47, PT. 15 / General Requirements
Detection Mode : Peak
Operating Voltage : 120V ac / 60Hz
Fundamental Frequency : 125 kHz

ATS-1190

% (Operating Voltage)	Peak Amplitude (dBuV)	Occupied Bandwidth (kHz)	Input Power (System)
100 (120)	39.50*	0.195	68.4w
85 (102)	39.30	0.180	63.2w
115 (138)	39.40	0.182	151.8w**

ATS-1192

% (Operating Voltage)	Peak Amplitude (dBuV)	Occupied Bandwidth (kHz)	Input Power (System)
100 (120)	60.0	0.177	61.2w
85 (102)	60.10*	0.180	63.2w
115 (138)	59.90	0.180	154.6w**

NX1700E (Master)

% (Operating Voltage)	Peak Amplitude (dBuV)	Occupied Bandwidth (kHz)	Input Power (System)
100 (120)	39.5*	0.195	68.4w
85 (102)	39.3	0.180	63.2
115 (138)	39.4	0.182	151.8**

NX1700E (Slave)

% (Operating Voltage)	Peak Amplitude (dBuV)	Occupied Bandwidth (kHz)	Input Power (System)
100 (120)	81.40*	0.140	19.2w
85 (102)	75.00	0.150	36.7w
115 (138)	60.00	0.170	37.3w**

Note: * Indicates worst-case peak amplitude and ** Indicates maximum input power for the tested operating voltage.

9 PHOTOS OF TESTED EQUIPMENT

Figure 9.1 Buss with 4.7k Ohm Terminating Resistors

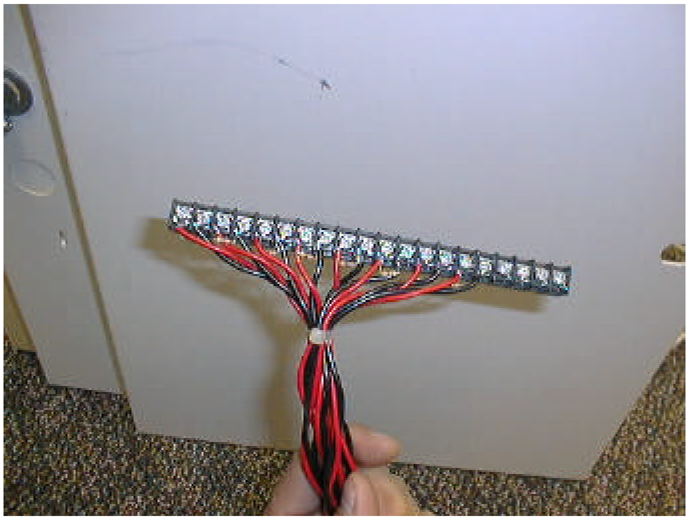


Figure 9.2 Buss with 4.7k Ohm Terminating Resistors

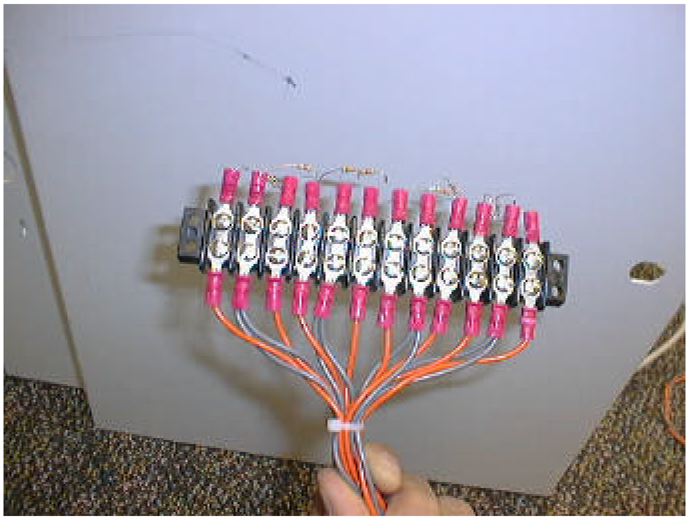


Figure 9.3 View of polarized connectors

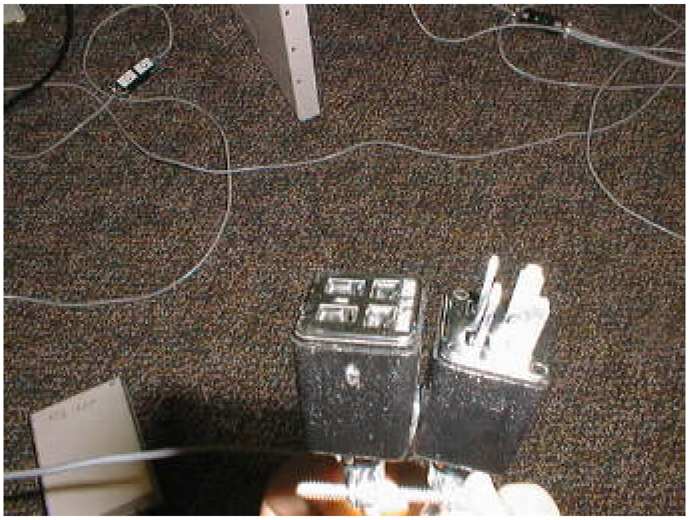


Figure 9.4 ATS-1190

Figure 9.5 ATS-1190

Figure 9.6 ATS-1190

Figure 9.7 ATS-1192

Figure 9.8 ATS-1192

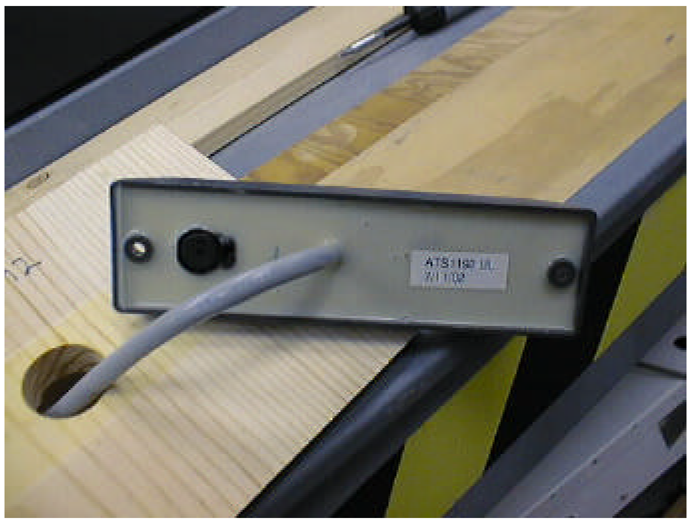


Figure 9.9 NX-1700E

Figure 9.10 NX-1700E

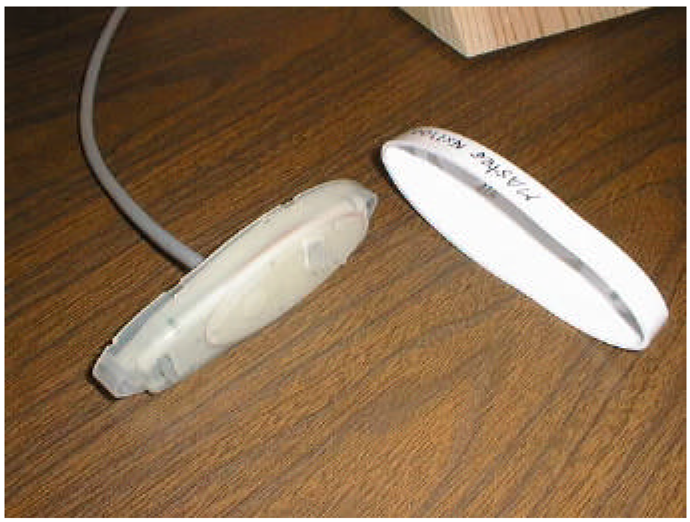


Figure 9.11 NX-1700E

Figure 9.12 NX-1700E

Figure 9.13 NX-1700E

Figure 9.14 NX-1700E

10 ADDITIONAL PRODUCT INFORMATION

10.1 User Manual

(To be provided by the manufacturer)