

**Axlon Electronics Corp.**  
**FCC Part 15, Certification Application**  
**PLD-01**

**UST Project No: 99-774**  
**March 21, 2000**

# MEASUREMENT/TECHNICAL REPORT

COMPANY NAME: **Axlon Electronics Corp.**

MODEL: **PLD-01**

FCC ID: **NYM-PLD-01**

DATE: **March 21, 2000**

This report concerns (check one): Original grant X  
Class II change \_\_\_\_\_

Equipment type: \_\_\_\_\_

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? yes \_\_\_\_\_ No X

If yes, defer until: \_\_\_\_\_  
date

N.A. agrees to notify the Commission by N.A.  
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Report prepared by:

United States Technologies, Inc.  
3505 Francis Circle  
Alpharetta, GA 30004

Phone Number: (770) 740-0717  
Fax Number: (770) 740-1508

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# SECTION 1

## GENERAL INFORMATION

## GENERAL INFORMATION

### 1.1 Product Description

The Equipment Under Test (EUT) is a Axlon Electronics Corp., Model PLD-01. The EUT is a 900 MHz Direct Sequence Spread Spectrum I/O unit and is part of the Palm Pal-lite home automation system. The system, with all of its resources provides a powerful and convenient control interface between the user and a wide range of automated systems such as security, lighting, HVAC, or personal computer. The EUT is a used in this system as a I/O Module for two way inter-operable control operation which can send commands out to activate one single or a series of jobs and also receive signal detected from the connected external devices such as windows break sensor, etc.

The transceiver is designed to operate on the following frequencies:

Channel	Frequency (MHz)
1	905.728
2	907.776
3	909.824
4	911.872
5	913.920
6	915.968
7	918.016
8	920.064
9	922.112
10	924.160

## **1.2 Related Submittal(s)/Grant(s)**

The EUT will be used with part of a system to send/receive data. The transceiver presented in this report will be used with another transceiver which has been submitted under FCC ID: NYM-PLB-01

The EUT is subject to the following authorizations:

- a) Certification as a transmitter
- b) Verification as a receiver and digital device

The information contained in this report is presented for the Certification & Verification authorization(s) for the EUT.

# **SECTION 2**

## **TESTS AND MEASUREMENTS**



## TEST AND MEASUREMENTS

### 2.1 Configuration of Tested System

The sample was tested per ANSI C63.4, Methods of Measurement from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (1992). Conducted and radiated emissions data were taken with the test receiver or spectrum analyzer's resolution bandwidth adjusted to 9 kHz and 120 kHz, respectively. All measurements are peak unless stated otherwise. The video filter associated with the spectrum analyzer was off throughout the evaluation process. Interconnecting cables were manipulated as necessary to maximize emissions. A block diagram of the tested system is shown in Figure 1. Test configuration photographs for spurious and fundamental emissions are shown in Figure 2.

The sample used for testing was received by U.S. Technologies on October 29, 1999 in good condition.

### 2.2 Test Facility

Testing was performed at US Tech's measurement facility at 3505 Francis Circle, Alpharetta, GA. This site has been fully described and submitted to the FCC, and accepted in their letter marked 31040/SIT. Additionally this site has also been fully described and submitted to Industry Canada (IC), and has been approved under file number IC2982.

### 2.3 Test Equipment

Table 2 describes test equipment used to evaluate this product.

### 2.4 Modifications

The following modifications were made to bring the EUT into compliance with FCC Part 15 limits for the transmitter portion of the EUT:

- 1) A two turn\* ferrite (Steward #25A2025) was added on the power input cable near the I/O module.
- 2) A ground strap was added from the negative conductor of the AC input behind the connector to the ground terminal of I5 on the daughter board.

These modifications will be included in the end product as given by Axlon's letter as shown on the following page.

LTG SERVICES;

7705521120;

Feb-24-00 4:26PM;

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02/24/00 09:59

**Axlon Electronics Corp**

21st century digital home at your fingertip

To the person who may concern,

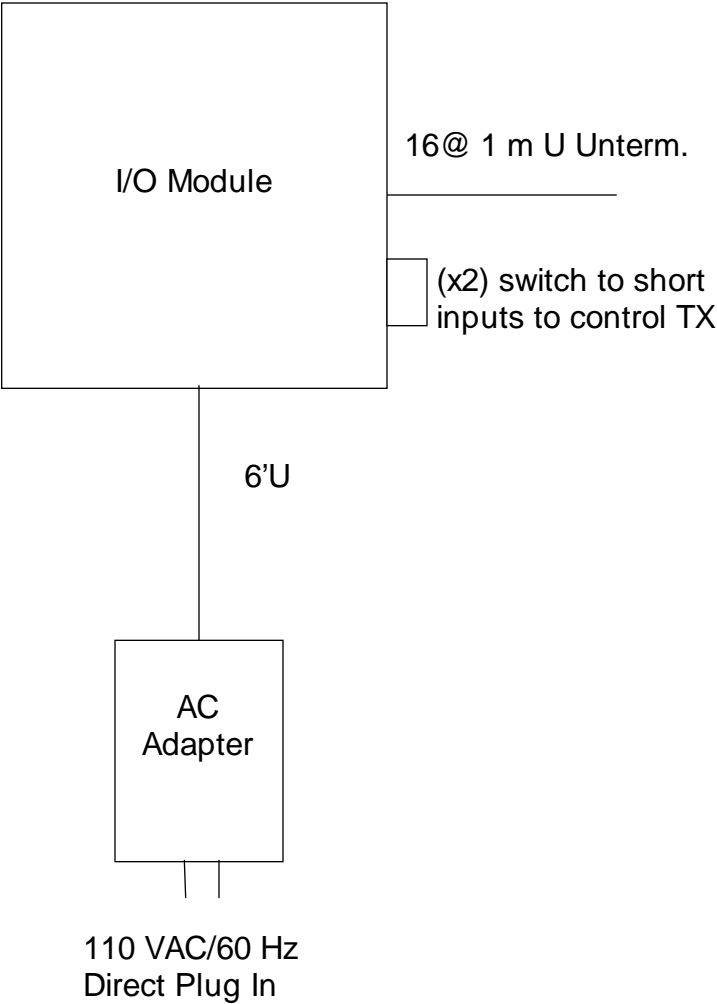
We authorized LTG to apply FCC & IC for PalmPal-lite on behave of Axlon Electronics Corp.  
All the modification that LTG and all its relevant laboratories have done to make PalmPal-lite  
approval, Axlon will implement accordingly on all PalmPal-lite production units.

Best Regards,

A handwritten signature in black ink, appearing to read "Ken Huang", is written over the printed name.

Ken Huang  
VP of marketing and sales  
Axlon Electronics Corp.

**FIGURE 1**  
**TEST CONFIGURATION**



**Test Date:** February 1 & 22, 2000  
**UST Project:** 99-774  
**Customer:** Axlon Electronics Corp.  
**Model:** PLD-01

**FIGURE 2a**

**Photograph(s) for Spurious Emissions (Front)**



**Test Date:** February 1 & 22, 2000  
**UST Project:** 99-774  
**Customer:** Axlon Electronics Corp.  
**Model:** PLD-01

**FIGURE 2b**

**Photograph(s) for Spurious Emissions (Back)**



**Test Date:** March 9, 2000  
**UST Project:** 99-774  
**Customer:** Axlon Electronics Corp.  
**Model:** PLD-01

**FIGURE 2c**

**Photograph(s) for Digital Device Emissions (Front)**



**Test Date:** March 9, 2000  
**UST Project:** 99-774  
**Customer:** Axlon Electronics Corp.  
**Model:** PLD-01

**FIGURE 2d**

**Photograph(s) for Digital Device Emissions (Back)**



**Test Date:** March 7, 2000  
**UST Project:** 99-774  
**Customer:** Axlon Electronics Corp.  
**Model:** PLD-01

**FIGURE 2e**

**Photograph(s) for Conducted Emissions**





**TABLE 1****EUT and Peripherals**

<b>PERIPHERAL MANUFACTURER</b>	<b>MODEL NUMBER</b>	<b>SERIAL NUMBER</b>	<b>FCC ID:</b>	<b>CABLES P/D</b>
I/O Module Axlon Electronics Corp.	PLD-01	1	NYM-PLD-01 (Pending)	16 @ 1m u unterm. 2 Switches
AC Adapter Axlon Electronics Corp.	MW41- 0900500	4	None	6' u

**TABLE 2**  
**TEST INSTRUMENTS**

<b>TYPE</b>	<b>MANUFACTURER</b>	<b>MODEL</b>	<b>SN.</b>
SPECTRUM ANALYZER	HEWLETT-PACKARD	8593E	3205A00124
SPECTRUM ANALYZER	HEWLETT-PACKARD	8558B	2332A09900
S A DISPLAY	HEWLETT-PACKARD	853A	2404A02387
COMB GENERATOR	HEWLETT-PACKARD	8406A	1632A01519
RF PREAMP	HEWLETT-PACKARD	8447D	1937A03355
RF PREAMP	HEWLETT-PACKARD	8449B	3008A00480
HORN ANTENNA	EMCO	3115	3723
BICONICAL ANTENNA	EMCO	3110	9307-1431
LOG PERIODIC ANTENNA	EMCO	3146	9110-3600
LISN	SOLAR ELE.	8012	865577
LISN	SOLAR ELE.	8028	910494
LISN	SOLAR ELE.	8028	910495
THERMOMETER	FLUKE	52	5215250
MULTIMETER	FLUKE	85	53710469
FUNCTION GENERATOR	TEKTRONIX	CFG250	CFG250TW15059
PLOTTER	HEWLETT-PACKARD	7475A	2325A65394

## 2.6 Antenna Description (Paragraph 15.203)

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

The Model Axlon Electronics Corp. PLD-01 incorporates an external antenna.

Manufacturer:       Joymax Electronic Corp  
                          17 Hsin-Jung Rd.  
                          Ping-Chen  
                          Tao-Yuan, Taiwan, R.O.C

Type:                  $\frac{1}{2}$  wave toroidal Antenna

Model Number:       GL-900

Gain:                 0 dBi

Connector:           Internal to product

(Please refer to the following descriptions provided by Axlon Electronics Corp.).

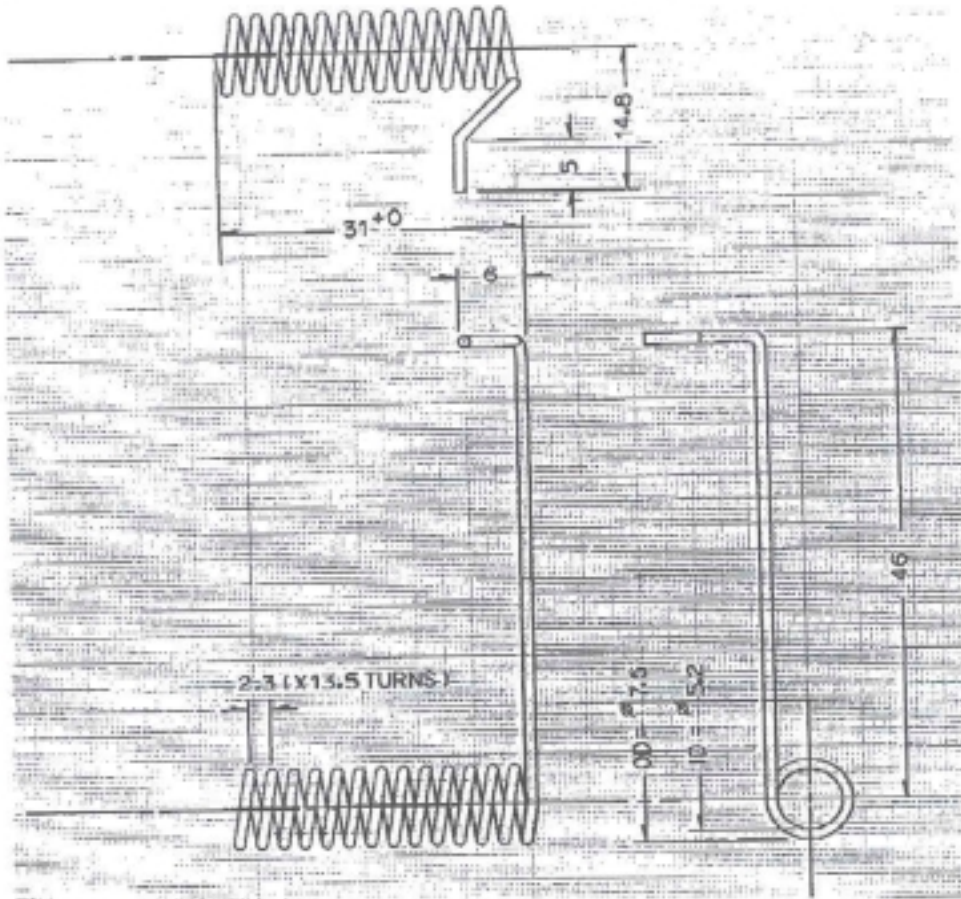
## SPECIFICATION

### GENERAL

1. DESCRIPTION: Helicoid antenna
2. CUSTOMER : AXLON ELECTRONICS CORPORATION
3. MODEL NO : GL-900
4. FREQUENCY : 902~928MHz
5. IMPEDANCE : 50 Ohms nominal
6. S.W.R. : Less than 2.0:1
7. GAIN : 0 dbi
8. ADMITTED POWER RADIATION : 5 W
9. TYPE OF RADIATION : Toroidal
10. POLARIZATION : Vertical
11. ELECTRICAL LENGTH :  $1/2 \lambda$
12. APPEARANCE/DIMENSION : See fig.1.
13. OPERATING TEMPERATURE RANGE :  $-20^{\circ}\text{C} \sim +65^{\circ}\text{C}$
14. STORAGE TEMPERATURE RANGE :  $-30^{\circ}\text{C} \sim +75^{\circ}\text{C}$



士位科技事業有限公司  
JOYMAX ELECTRONIC CORP.



士隆科技事案有限公司  
JOYMAX ELECTRONIC CORP.

## **2.7 Peak Power Within the Band 902 - 928 MHz per FCC Section 15.247(b)**

Since the EUT contains an integrated antenna, the peak power within the band 902 - 928 MHz has been measured by placing the EUT on an OAT's site and maximizing the fundamental emissions as shown in Figure 3a through 3c. The transmitters peak power was then calculated as shown in table 3

The EUT did not incorporate any antennas of directional gain greater than 6 dBi, therefore the output power has not been reduced as required by 15.247(b)(3).

**TABLE 3**  
**PEAK POWER OUTPUT**

**Test Date:** December 21, 1999  
**UST Project:** 99-774  
**Customer:** Axlon Electronics Corp.  
**Model:** PLD-01

Frequency (MHz)	Receiver Reading (dBm) @3m	Correction Factor (dB)	Corrected Reading (V/m) @3m	Measured Power (Watt)	FCC Limit (Watt)
905.728	-31.9	30.7	0.194984	0.011	1.0
913.920	-29.5	30.8	0.260015	0.020	1.0
924.160	-30.2	31.0	0.245471	0.018	1.0

Transmitters peak power calculated using:

$$P (W) = \frac{(E*d)^2}{30*G}$$

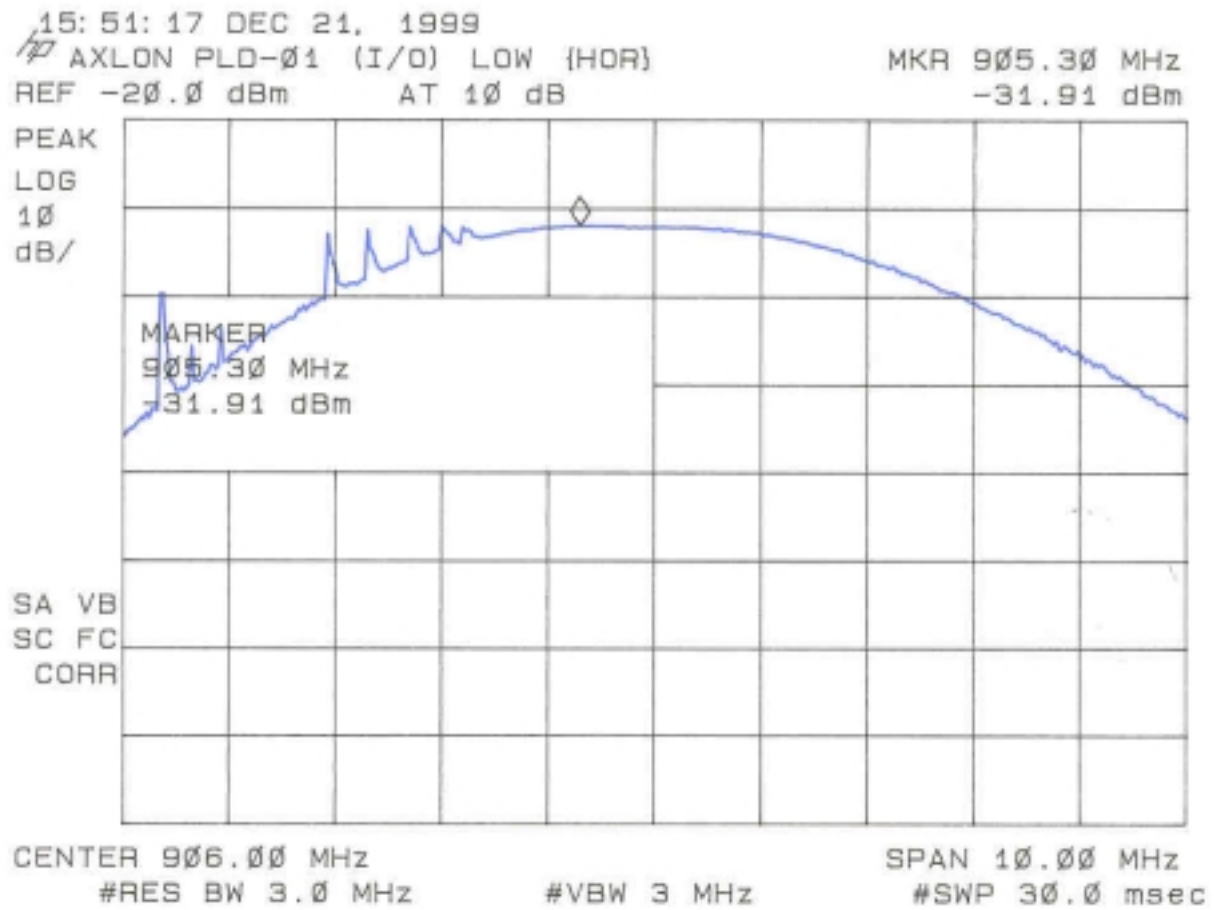
where d = 3 meters, E = corrected measured field strength in V/m, and G = numeric gain of transmitting antenna (1.0 for 0 dBi).

**Test Results**

**Reviewed By**

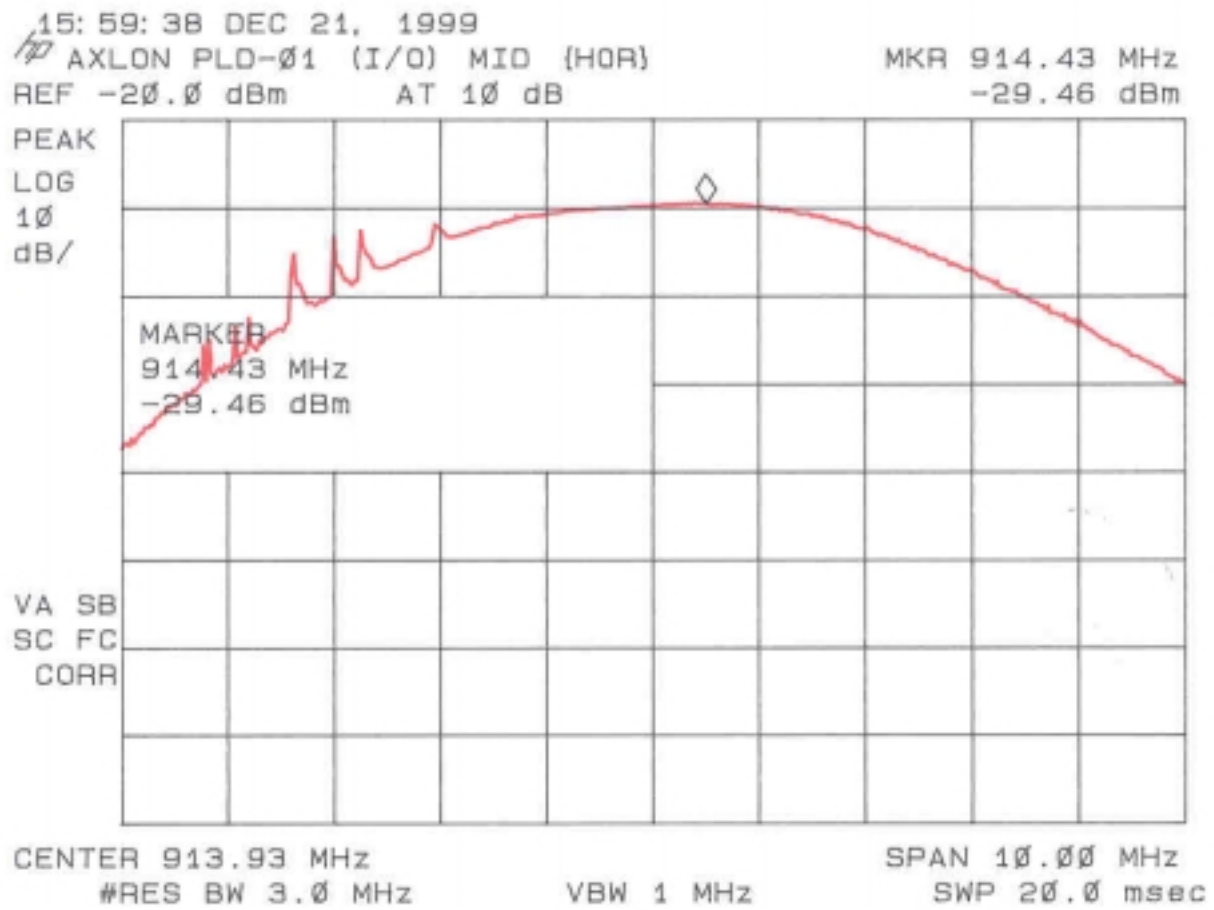
**Signature:** \_\_\_\_\_ **Name:** Tim R. Johnson

**Figure 3a.**  
**Peak Power per FCC Section 15.247(b) (Low)**





**Figure 3b.**  
**Peak Power per FCC Section 15.247(b) (Mid)**



**Figure 3c.**  
**Peak Power per FCC Section 15.247(b) (High)**

