TEST REPORT

CLASS II PERMISSIVE CHANGE APPLICATION

FOR

Intercontinental Technologies, Ltd.

TELECRANE Model F21-6S-TX Industrial Remote Control Transmitter

TELECRANE Model F21-4S-TX Industrial Remote Control Transmitter

TELECRANE Model F21-4D-TX Industrial Remote Control Transmitter

FCC ID: JI9-F21-6S-008

TESTED UNDER

FCC RULES, 47 CFR 15.231(a)

Intentional Radiators: Periodic Operation, Remote Control Transmitter

Engineering Statement: The measurements shown in this report were made in accordance with the procedure indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurement made, the equipment tested is capable of operation in accordance with the requirements of Part 15 of the FCC Rules under normal use and maintenance.

Steven C. Habisohn

President, Intercontinental Technologies, Ltd.

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1. SUMMARY

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15.231.

Test Name	Test Method/Standard	Result
Duty Cycle	15.231	Pass
Deactivation Time	15.231(a)(1)	Pass

2. TESTING OVERVIEW

Intercontinental Technologies, Ltd. performed testing on its TELECRANE Models F21-6S-TX, F21-4S-TX, and F21-4D-TX Industrial Remote Control Transmitters, Channel 008, as part of an application for a "Class II Permissive Change" to its original FCC Grant of Equipment Authorization under FCC ID: JI9-F21-6S-008, issued on May 18, 2012.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the transmitter.

The tests were based on FCC Part 15 Rules. The tests described in this document were formal tests as described with the objective to evaluate compliance of the Equipment Under Test (EUT) to the requirements of the aforementioned specifications.

All testing was performed at Intercontinental Technologies, Ltd., 558-2 Plate Drive, East Dundee IL 60118 on November 6, 7, and 13, 2012. All equipment used in making physical determination is accurate and bears recent traceability to the National Institute of Standards and Technology.

The three models of transmitters have identical RF transmitting circuitry, and differ only in firmware and the number and type of pushbutton switches installed. The F21-6S-TX has 6 single-step pushbuttons, the F21-4S-TX 4 single-step pushbuttons, and the F21-4D-TX 4 double-step pushbuttons. Plots for all three models are shown to demonstrate uniformity in duty cycles and deactivation times.

3. DEACTIVATION TIME TEST

Test Requirements:	15.231(a)(1)	**Test Engineer:**	R. W. Schauer
Test Results:	Pass	**Test Date:**	11/6, 7, 13/2012

Test Procedures:

As required by 47 CFR 15.231(a)(1), a manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

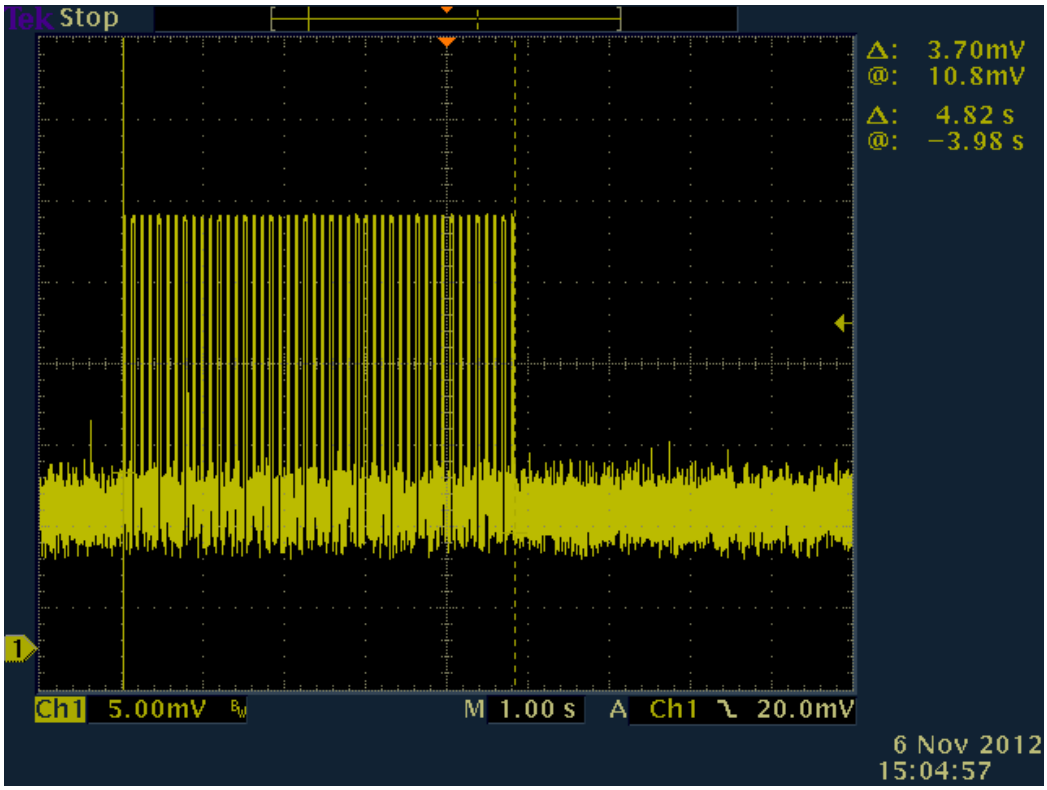
The EUT antenna was attached and the waveform was received by the test antenna which was connected to the test receiver, with the Received Signal Strength Indicator output of the receive IC coupled to the oscilloscope. The EUT was operated and the deactivation time was measured with the oscilloscope. For purposes of this test, the receiver's front-end amplifier automatic gain control switching capability was disabled.

Deactivation Time Test Results: (see also Plots 1, 2, and 3 on next two pages)

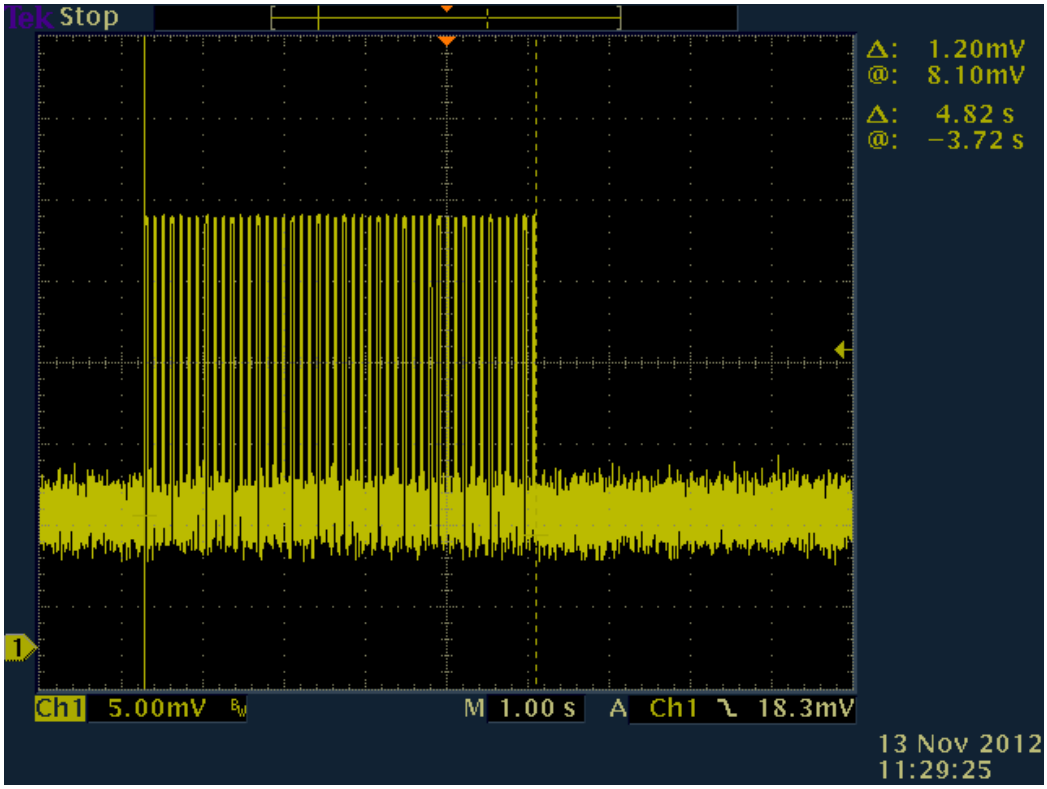
Frequency (MHz)	Original Reported Transmission Time (sec)	New Transmission Time (sec)	Limit (sec)
311.9050	0.731	4.82	5 seconds or less

All pushbuttons except for the red E-stop are momentary and will cease transmission within five (5) seconds of release of the pushbutton. The E-stop is a mechanically latching button, and the control circuitry is arranged so that when it is pressed and latched, the transmission ceases within five (5) seconds.

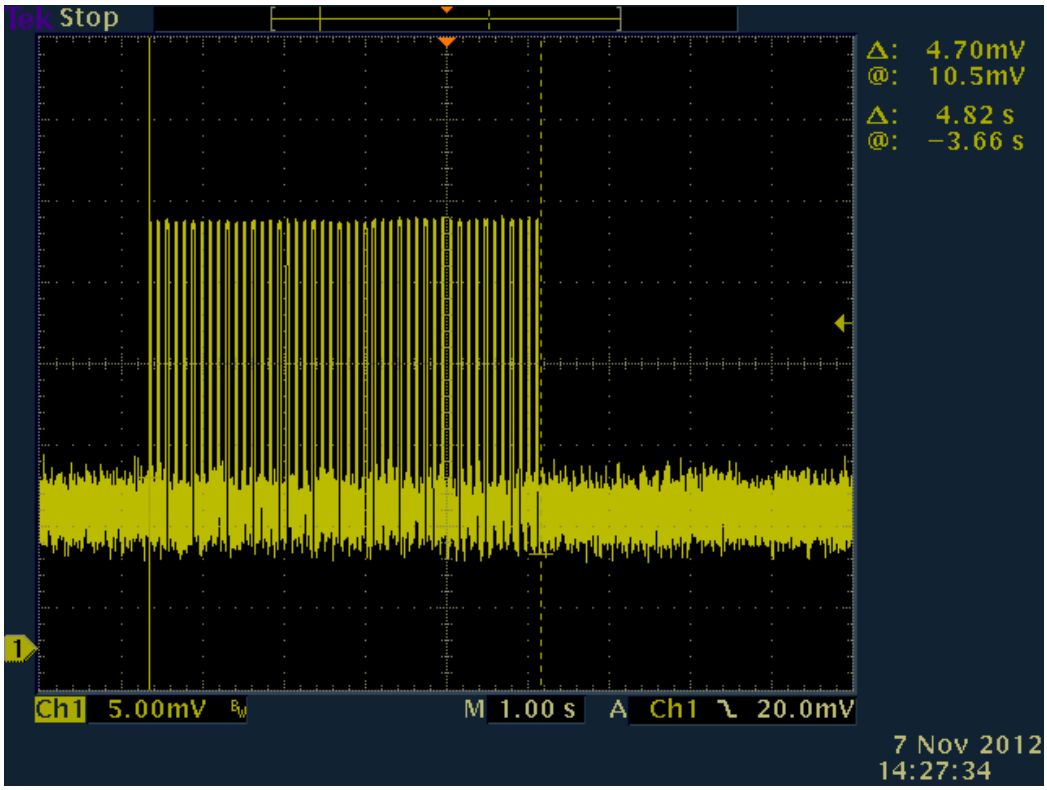
Plot 1: Deactivation Time Test, Model F21-6S-TX



Plot 2: Deactivation Time Test, Model F21-4S-TX



Plot 3: Deactivation Time Test, Model F21-4D-TX



4. DUTY CYCLE TEST

Test Requirements:	15.231	**Test Engineer:**	R. W. Schauer
Test Results:	Pass	**Test Date:**	11/6, 7, 13/2012

Test Procedures:

This data is used to calculate the averaging correction factor that is applied to the measured peak radiated emissions results for purposes of determining average emissions.

The EUT antenna was attached and the waveform was received by the test antenna which was connected to the test receiver, with the Received Signal Strength Indicator output of the receive IC coupled to the oscilloscope. The EUT was operated and the pulse train/duty cycle was measured with the oscilloscope. For purposes of this test, the receiver's front-end amplifier automatic gain control switching capability was disabled.

As only the period was changed, emissions tests were not performed. The hardware of the EUT is identical to that originally tested; only the firmware has been changed to alter the period. There is no change to the peak emissions. No intentional change has been made to the ON time and differences in measurements are attributed to measurement tolerances between labs.

Duty Cycle Calculations from Original Test Report:

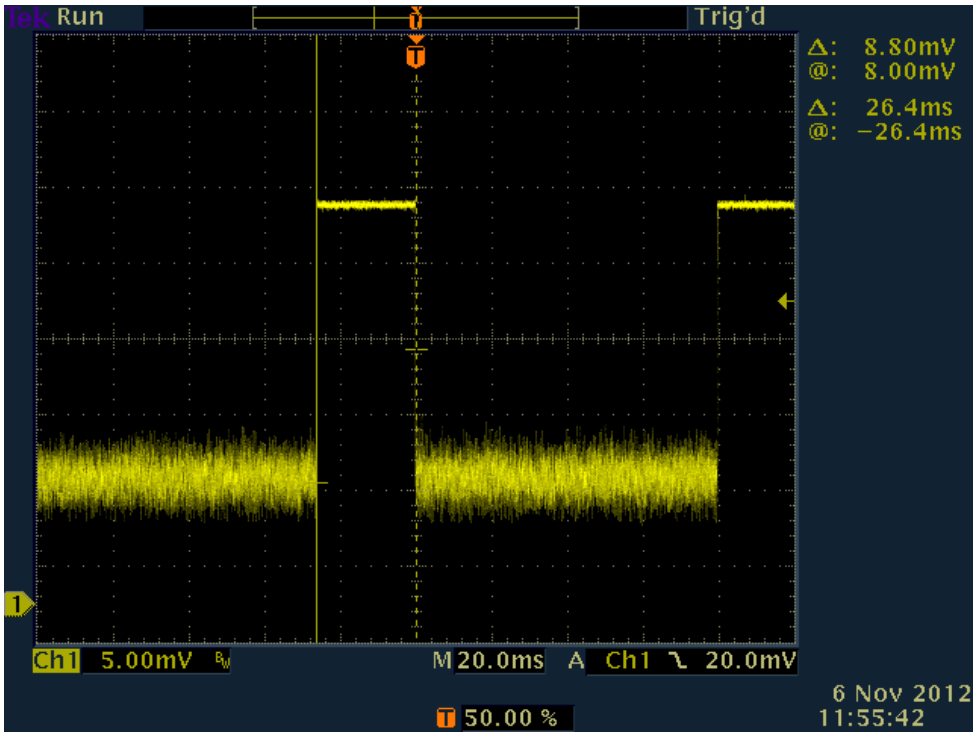
Frequency (MHz)	Pulse Width (ms)	Actual Period Measurement (ms)	Period or 100 ms, whichever is lesser	Average Correction Factor (dB) 20*log(Pulse Width/Period)	Average Margin (dB)
311.9050	26.2	203.4	100	-11.63	-7.84

NOTE: The worst case originally reported test results for both harmonics and fundamental was -7.84 dB Margin.

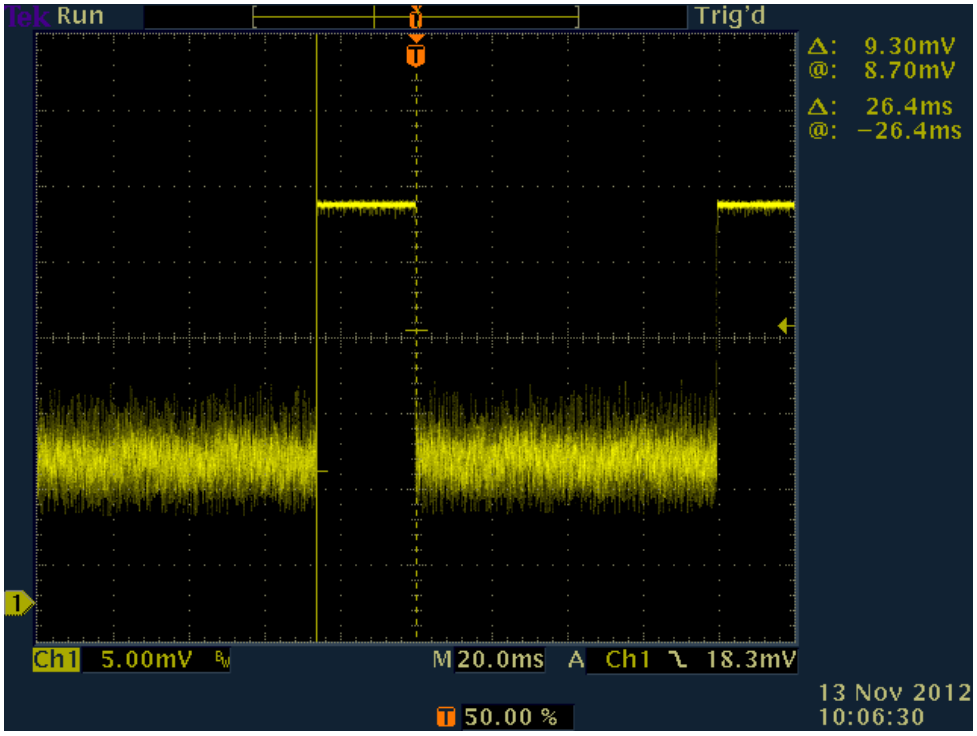
New Duty Cycle Calculations: (see also Plots 4 through 12 on next five pages)

Frequency (MHz)	Pulse Width (ms)	Actual Period Measurement (ms)	Period or 100 ms, whichever is lesser	Average Correction Factor (dB) 20*log(Pulse Width/Period)	Average Margin (dB)
311.9050	26.4	106	100	-11.57	-7.78

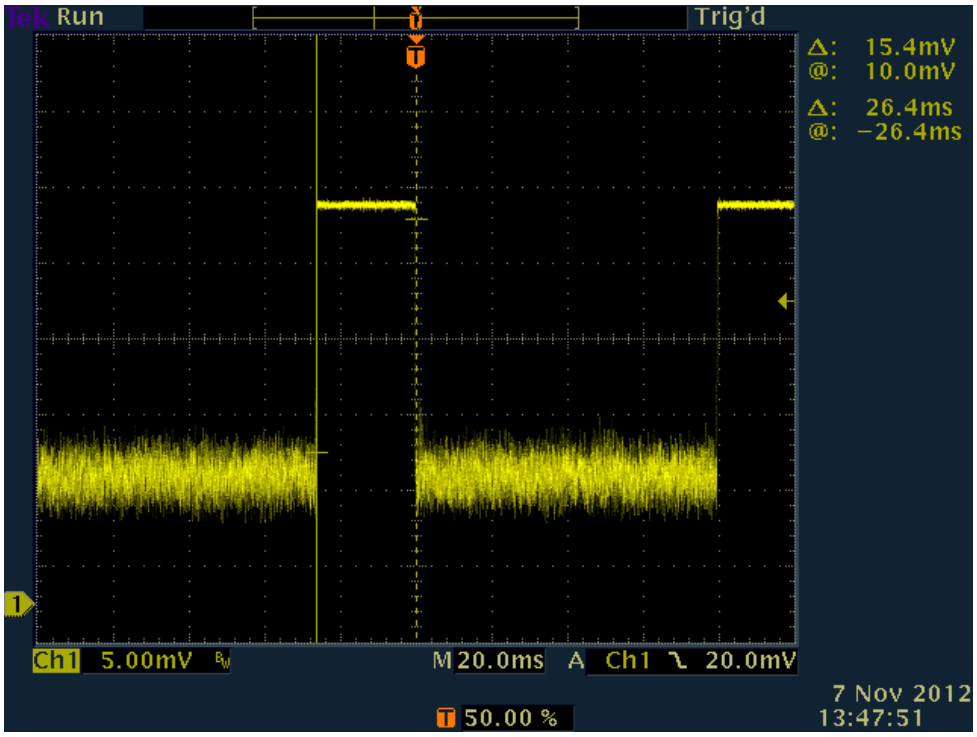
Plot 4: Duty Cycle, ON Time, Model F21-6S-TX



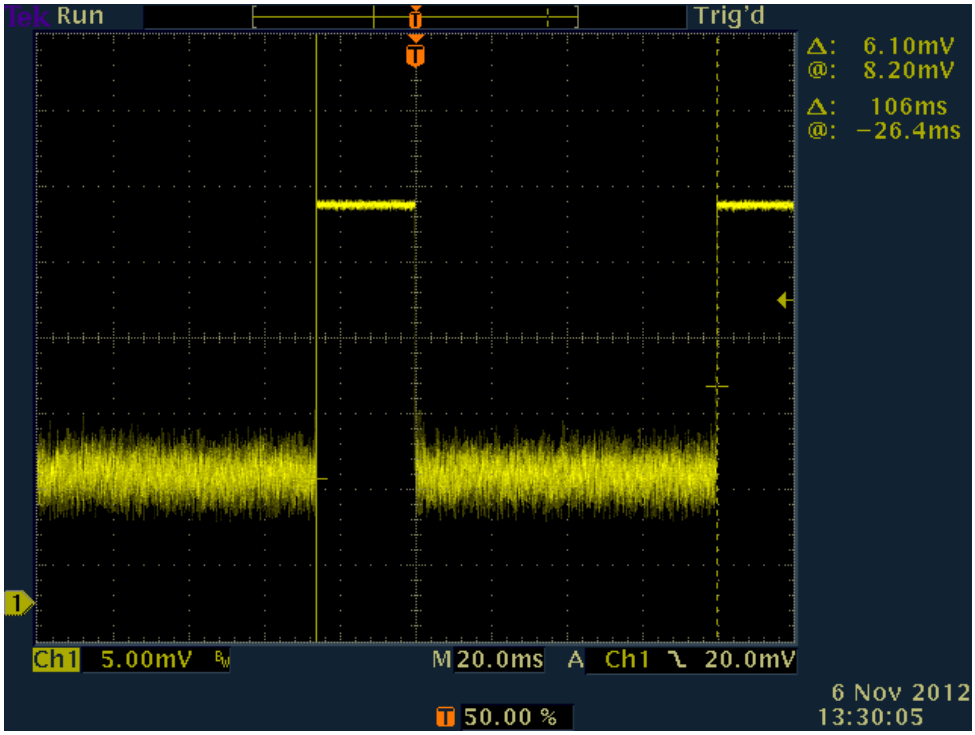
Plot 5: Duty Cycle, ON Time, Model F21-4S-TX



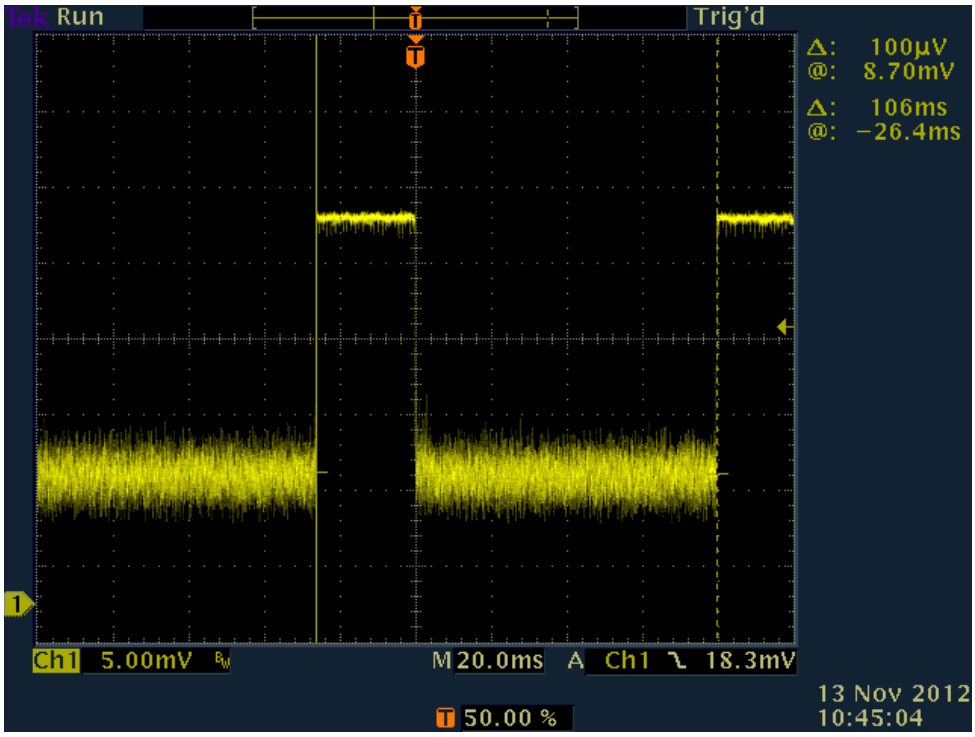
Plot 6: Duty Cycle, ON Time, Model F21-4D-TX



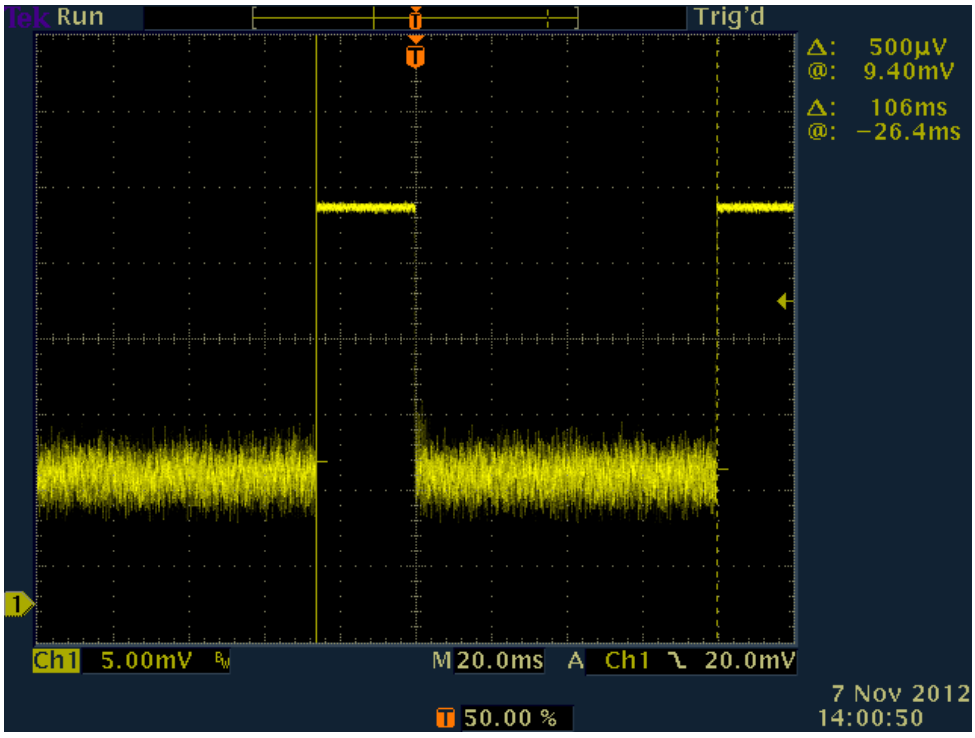
Plot 7: Duty Cycle, Period, Model F21-6S-TX



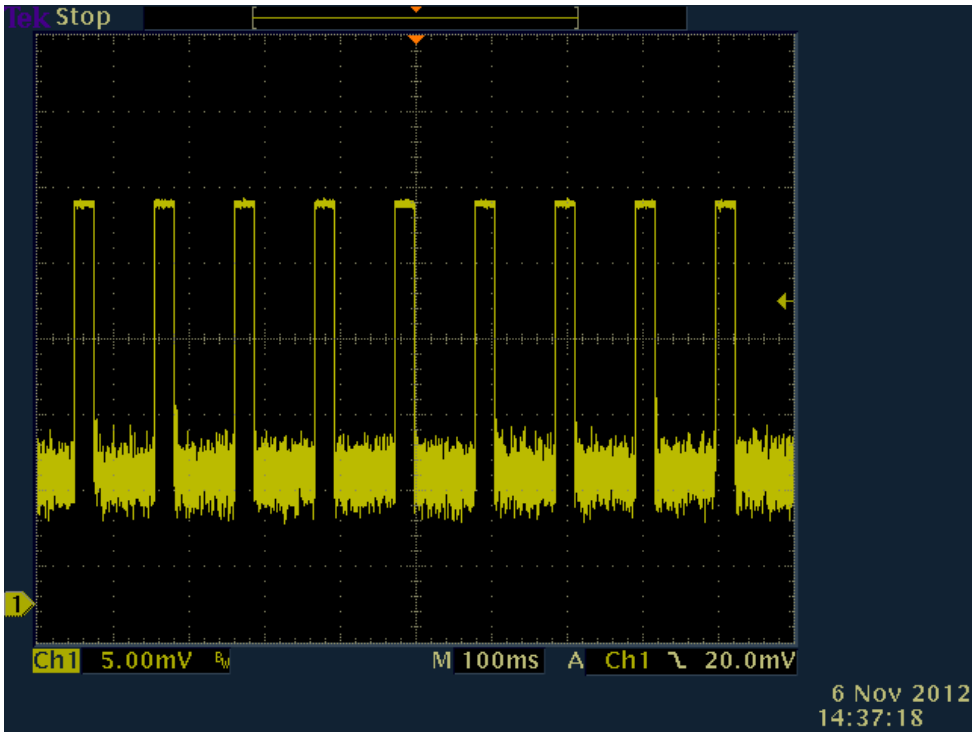
Plot 8: Duty Cycle, Period, Model F21-4S-TX



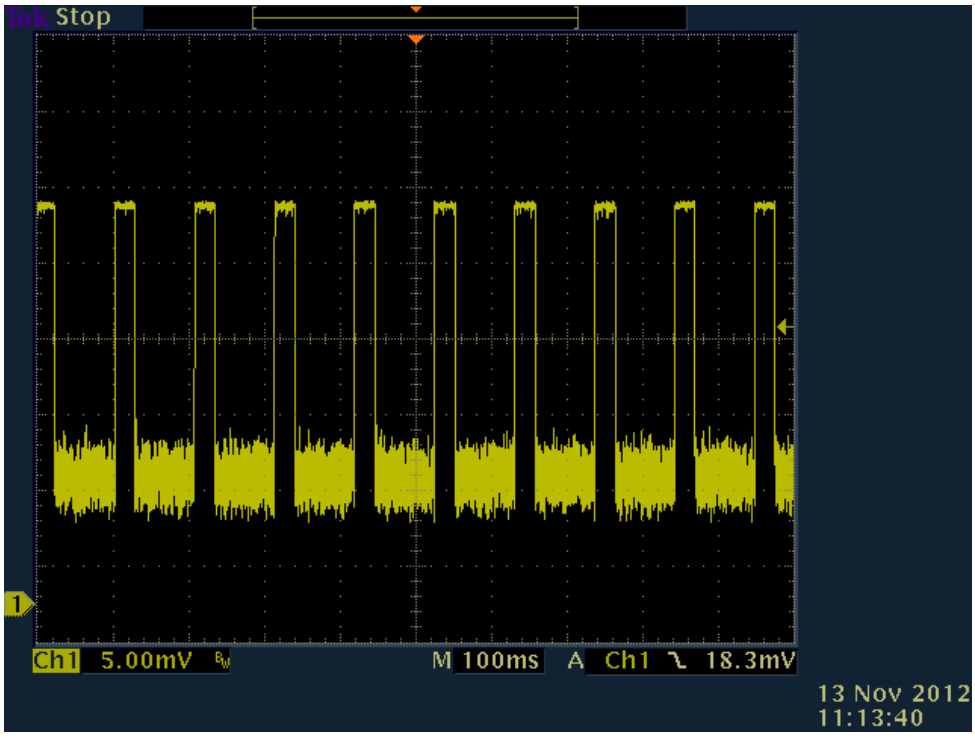
Plot 9: Duty Cycle, Period, Model F21-4D-TX



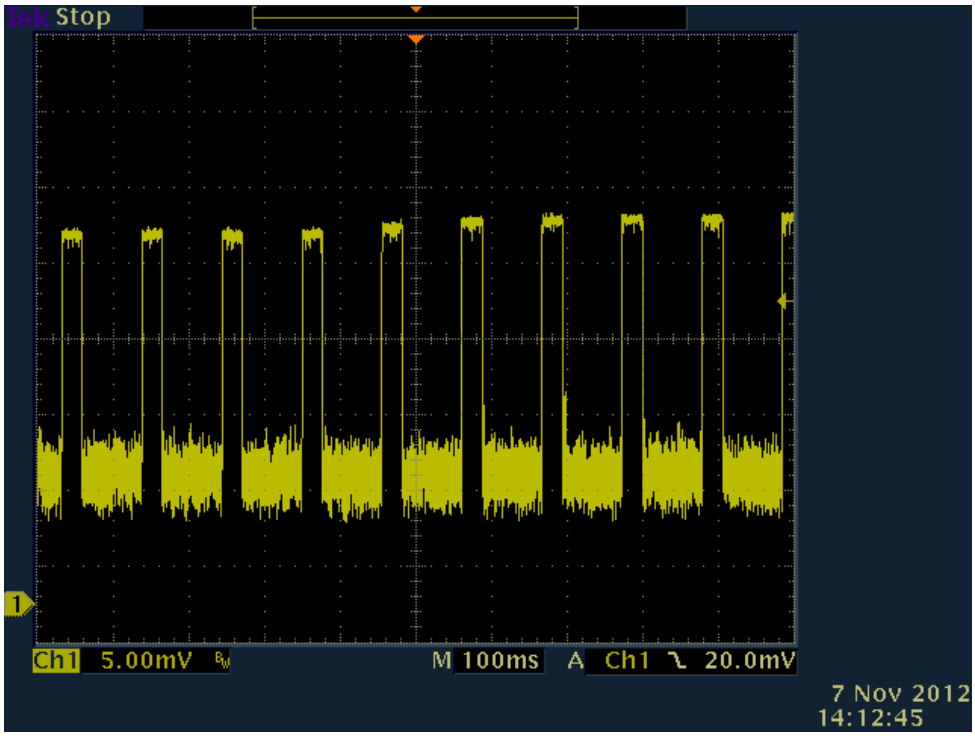
Plot 10: Typical Waveform, Showing Uniformity of Pulse Train, Model F21-6S-TX



Plot 11: Typical Waveform, Showing Uniformity of Pulse Train, Model F21-4S-TX



Plot 12: Typical Waveform, Showing Uniformity of Pulse Train, Model F21-4D-TX



5. TEST EQUIPMENT USED

Equipment	Manufacturer	Model	Serial	Last Cal Date	Cal Due Date
Test Receiver	Telecrane	F24-6D-RX	LAB-AM1	NCR	NCR
Oscilloscope	Tektronix	TDS3104C	C013927	10/24/2012	10/24/2013