ACECO FC2002 Frequency Counter

Introduction

The Aceco FC2002 hand-held frequency counter is a more professional counter, even advanced features such as field strength measurement and auto hold are incorporated. It is compact, truly pocket-sized, test instrument designed for ease of use and dependable performance. Supplied as a complete with internal NiCd pack, AC wall charger and 7 section telescopic antenna.

Specifications

Frequency range:	10 Hz - 3 GHz
Weight:	250 g
Size:	100 mm high x 68 mm wide x 31 mm deep
Impedance:	1 * dual purpose BNC Socket
	50 Ohms input for range 1 MHz to 3 GHz
	1 Meg Ohm input for range 10 Hz to 50 MHz
Case:	Stamped aluminum with black anodized finish
Battery:	Internal 4 x AA 600 mAH NiCd pack
Power:	9 VDC 300 mA
Timebase:	Less than 1 PPM at room temperature

Features

- 10 digit Liquid Crystal Display
- Hi-Z low range
- Filter to prevent display of random noise
- Automatic hold
- Measures frequency and period
- LED back light
- Beeper
- Low power consumption (Average 6 hour battery life)
- Hold switch to lock display
- Low battery indicator
- Ultra sensitive synchronous detector 16 section bargraph to show RF signal strength
- High speed 300 MHz direct counter with 0.1 Hz resolution
- 4 selectable gate speeds

Controls

1. Power Switch - This slide switch turns the counter on and initiates a 2 second test of all the LCD segments.
2. Amp Switch - This slide switch selects either the 1 Meg Ohm high impedance amplifier or 50 Ohm amplifier and prescale.
3. Range Switch - This should be switched to the 300 MHz position for frequencies between 1 MHz and 300 MHz and switched to the 3 GHz position for frequencies between 10 MHz and 3 GHz.
4. Lite Switch - This slide switch turns the LCD back light on and off.
5. Filter Switch – This slide switch turns the filter on and off.
6. Function Button - This selects the frequency or period. This button has four settings. One each for displaying frequency or period as these are received, and two settings for automatic hold of the first frequency or period captured.
7. Hold Button - This holds the current display and stops the counter from counting.
8. Gate Button - This selects the gate or measurement time. A longer gate time allows counting for longer period and results in higher accuracy.
9. Calibration - The calibration adjustment opening is located on the front panel of the counter. This allows access to the trimmer capacitor that provides about a 10 PPM adjustment range of the time base oscillator. This is not usually necessary but to do so read a signal of a known frequency before adjusting the trimmer for correct frequency display. If you calibrate at 4.1943 MHz or above then the counter will be more accurate.

Warranty

Aceco Electronics, Corp. guarantees the counter and its accessories for one year against defects in manufacture. This warranty does not cover items that have been modified, subject to unauthorized repairs, misuse or abuse. This warranty does not cover damage caused by excessive power levels applied to the signal input. Never make any kind of connection between the counter and a transmitter.

Hints and Tips

1. NiCd Operation

This frequency counter can operate for up to six hours from its fully charged NiCd batteries. They are charged when the unit is plugged into the supplied AC/DC adapter. Full recharge will occur over 12 to 16 hours. Before recharging the batteries you should be deep cycled occasionally by allowing them to completely discharge to maintain maximum battery capacity. The NiCd batteries should last for several years. However, it is a good idea to check them every twelve months for signs of corrosion or leakage. Always replace the whole set if any one cell fails.

2. Signal Input

When using the counter with an antenna for signal pick up, random frequencies may appear on the display. This is quite normal and is caused by the high gain of the receiver circuits, which amplify noise in the absence of a strong readable signal. Never get the unit too close to a transmitter as internal damage will result.

3. Antenna Selection

The supplied telescopic antenna is best for general purpose use. This is because its length can be adjusted to suit the frequency required. Usually you will want a shorter antenna for UHF and a fully extended one for VHF / HF.

4. Reception Distance From Transmitter

The distance from which you will be able to receive frequencies will depend upon the type and location of the transmitting antenna, transmitter output power and the frequency in use.
Some typical distances are:

Cordless Phone	0.3 meters
Cellular Phone	3 - 20 m
CB radio	2 - 8 m
VHF Two Way Radio	3 - 30 m
UHF Two Way Radio	3 - 30 m

Input Sensitivity (Typical)

Amplifier:	1 Meg Ohm	50 Ohm
Impedance:	1 Meg Ohm, 30 pF	50 Ohm VSWR less than 2:1
Range:	10 Hz – 50 MHz	1 MHz - 3 GHz
Sensitivity:	< 10 mV at 10 Hz – 10 MHz	< 0.8mV at 100 MHz
	< 20 mV at 10 MHz – 50 MHz	< 6 mV at 300 MHz
		< 7 mV at 1.0 GHz
		< 100 mV at 2.4 GHz
Max. input:	100 Vrms	15 dBm

RF Signal Strength Bargraph

Frequency	1st Segment	Full Scale
27 MHz	7mV	100 mV
150 MHz	5 mV	90 mV
800 MHz	10 mV	200 mV

Frequency Display Resolution

Range	Gate Time (Seconds)	LSD	Sample Display
300 MHz	0.0625	10 Hz	300.00000 MHz
	0.25	1 Hz	300.000000 MHz
	1.0	1 Hz	300.000000 MHz
	4.0	0.1 Hz	300.0000000 MHz
3 GHz	0.0625	1000 Hz	3000.000 MHz
	0.25	100 Hz	3000.0000 MHz
	1.0	10 Hz	3000.00000 MHz
	4.0	10 Hz	3000.00000 MHz