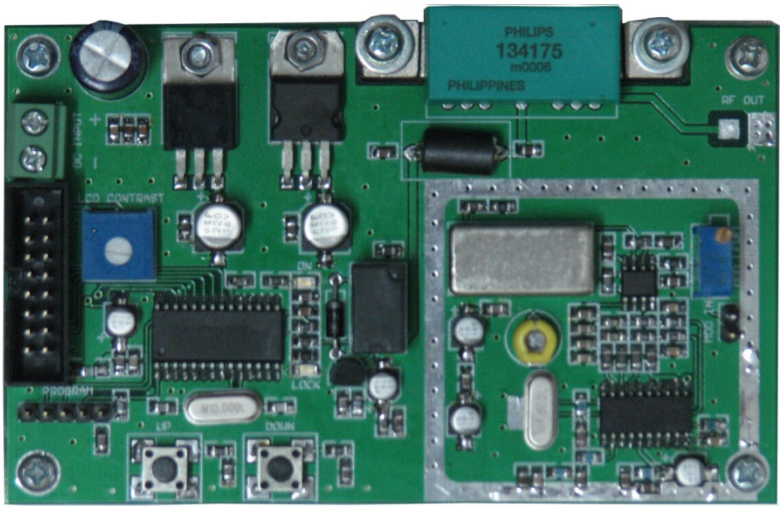
PLL FM Exciter

Model: PLL-11031K
Model: PLL -11032K
Model: PLL -11033K
Model: PLL -11034K
Model: PLL -11035K
Model: PLL -11036K



User Manual

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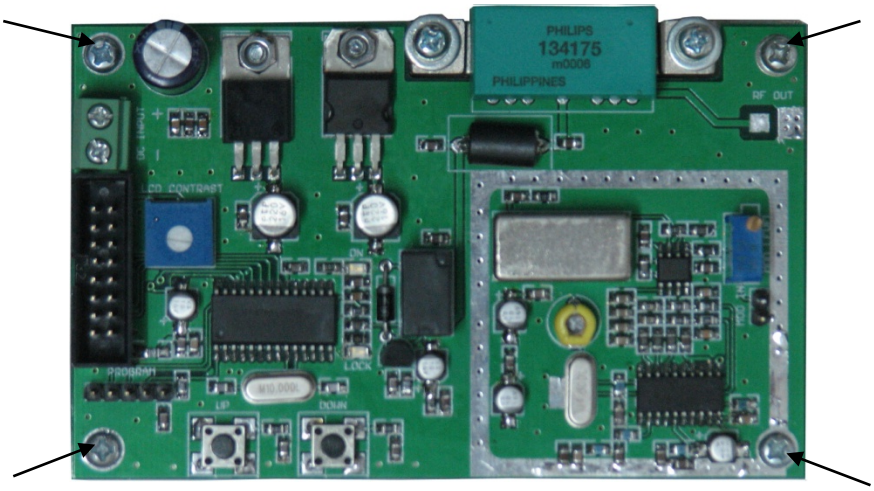
General Information

The PLL-1103xK is the latest in a series of FM transmitter for demanding applications. It is especially suited for repeaters, audio and data links, packet radio, and remote control. The PLL-1103xK was designed to provide a single-channel FM transmitter for transmit in the VHF and UHF bands.

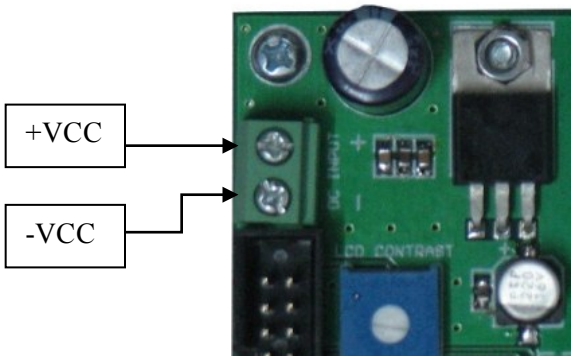
Installation Mounting

Some of support should be provided under the PC board, generally mounting the board with 4 holds. The transmitter board relies on the mounting hardware to provide the DC and RF output ground connections to the ground plane on the board.



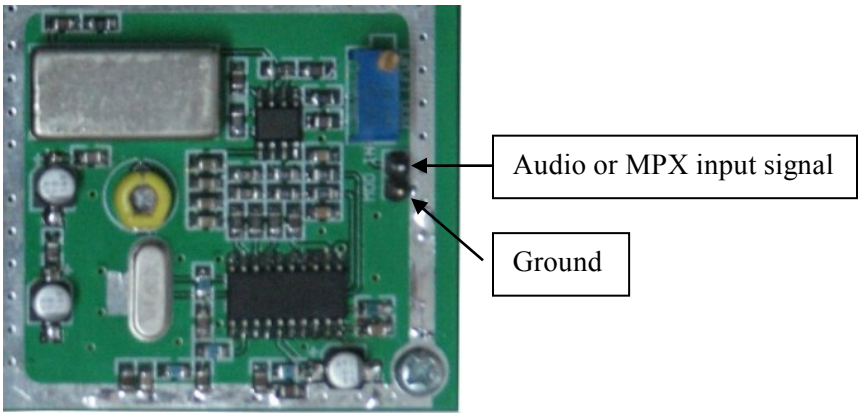
Electrical Connections

Power supply should be connected to the connector on the PC board with #4 wire, which can be extended to a connector or feed through capacitors used on the cabinet in which it is installed. Be very careful not to route the wiring near RF components on the board, for instance underneath the board. The receiver operates on +18.0 to 24.0 VDC at about 800 mA peaks with full RF output. A well-regulated power supply should be used. Be sure that the power source does not carry high voltage or reverse polarity transients on the line, since semiconductors in the transmitter can be damaged.



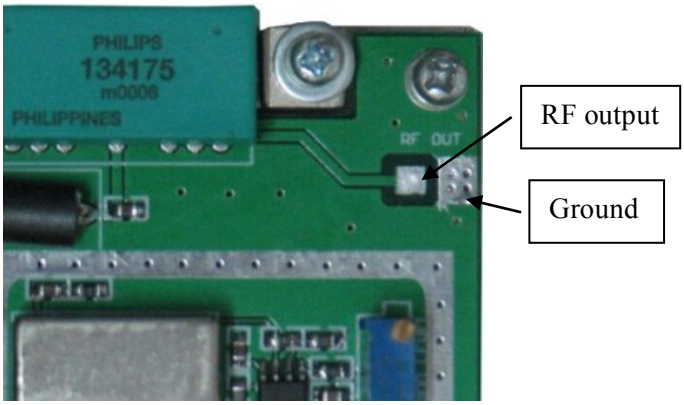
Audio/MPX Input Connections

Be sure to observe polarity! Signal. You can connect either audio or MPX (composite signal) to this transmitter.



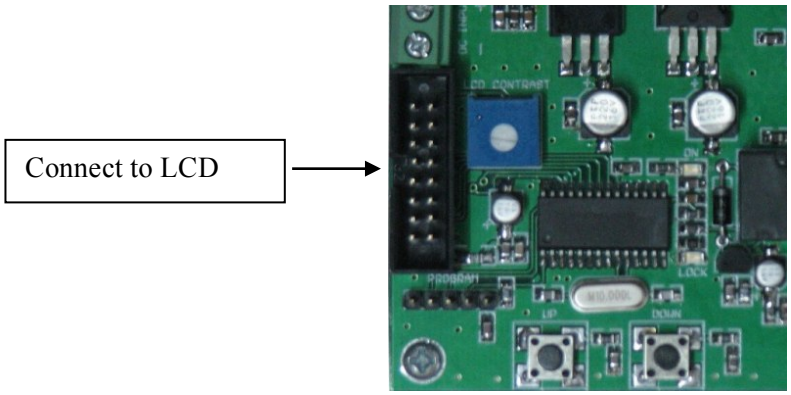
RF Output Connections

The RF output connection should be made to the transmitter with a solder pad on transmitter. If you want to extend the RF output connection, we recommend using a short length of RG-316 coax with the plug and keep the pigtails very short.



LCD Connections

The LCD can display as 16x2 typical. You can connect to transmitter board.



Quick Specification Reference

- Operating frequency

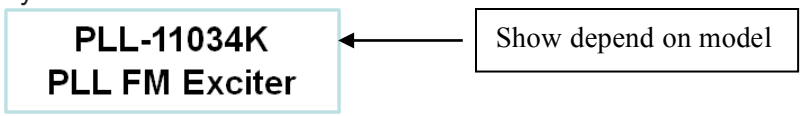
- Model: PLL -11031K 87.50 – 108.00 MHz
- Model: PLL -11032K 136.00 – 174.00 MHz
- Model: PLL -11033K 244.00 – 246.00 MHz
- Model: PLL -11034K 300.00 – 330.00 MHz
- Model: PLL -11035K 330.00 – 360.00 MHz
- Model: PLL -11036K 400.00 – 440.00 MHz
- Model: PLL -11037K 440.00 – 480.00 MHz

- RF Output: up to 1 Watts
- Operating Power: +24.0Vdc at 800 mA
- Size: 70mm. W x 110mm. D x 30mm. H

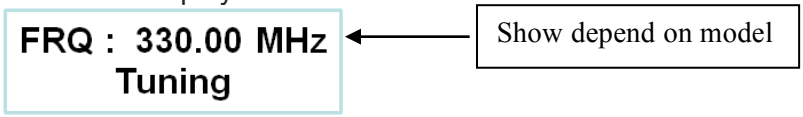
Operation

Turn on

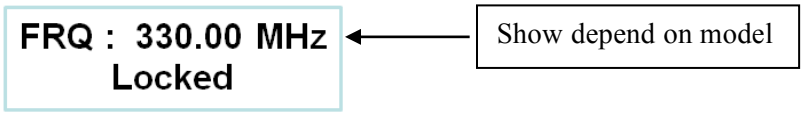
Be sure that the power source does not carry high voltage or reverse polarity transients on the line, since semiconductors in the transmitter can be damaged. After you turn on, The LCD can be displayed as:



Then the LCD will displayed as:

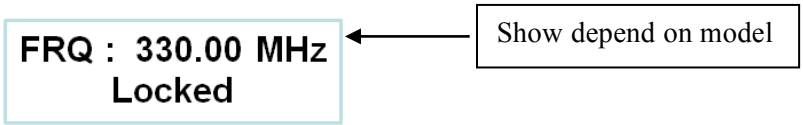


The PLL of transmitter will tune. After the PLL is locked to the frequency, LCD will be displayed as:

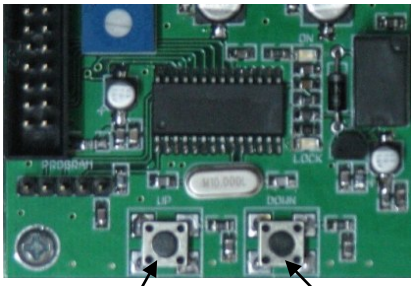


Frequency Setting

This menu lets you read and set the operating frequency.



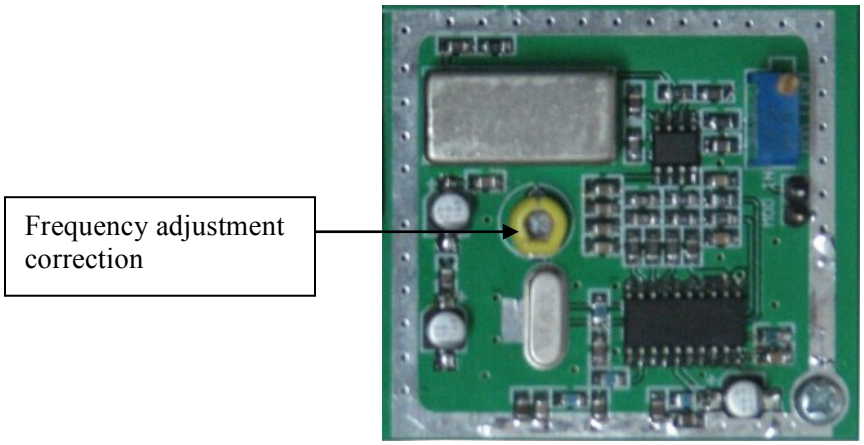
You can modify the set frequency using the UP (the frequency increases) and DOWN (the frequency decreases) push buttons. After having set a new frequency value, the exciter will release from the current frequency and it will latch onto the new operating frequency.



Adjustments

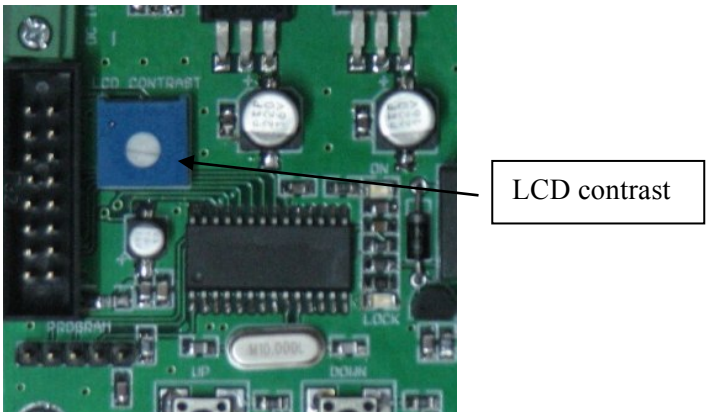
Frequency correction

The frequency from VCO will oscillator as frequency setting. The frequency can be error in the long time in use. You can adjustment to frequency correction by varicap as the picture as below.



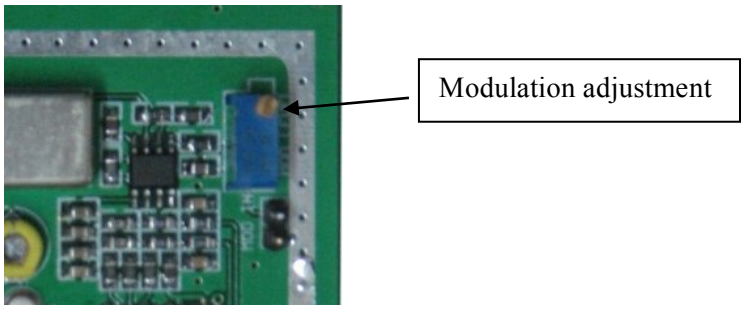
LCD contrast

The LCD display can adjust the contrast as picture below:



Modulation input signal adjustment

You can adjust to modulation signal by potentiometer.



TROUBLESHOOTING

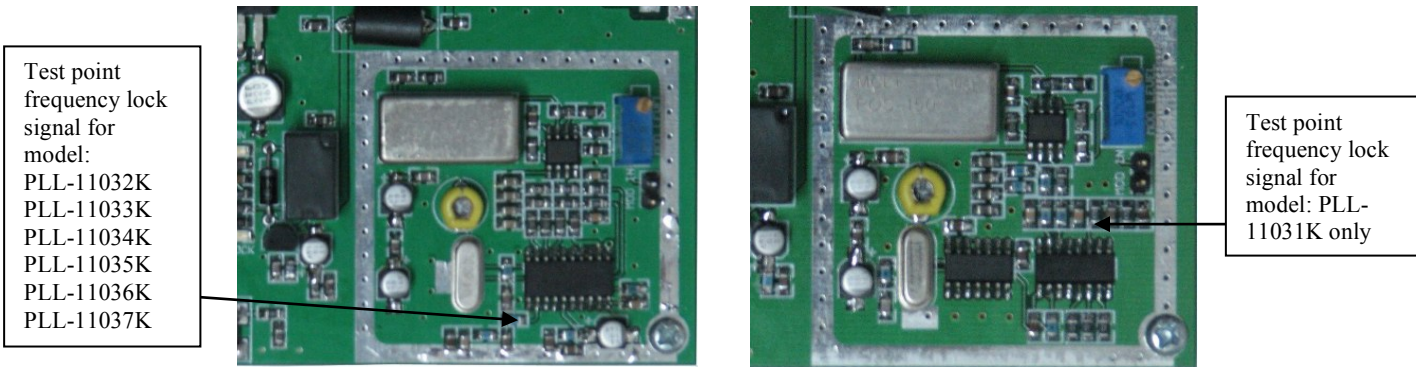
General

The usual troubleshooting techniques of checking dc voltages and signal tracing with an RF voltmeter probe, oscilloscope and spectrum analyzer will work well in troubleshooting the PLL-1103xK. DC voltage charts and a list of typical RF output levels are given to act as a guide to troubleshooting. Although voltages may vary widely from set to set and under various operating and measurement conditions, the indications may be helpful when used in a logical troubleshooting procedure. The most common troubles in all kits are interchanged components, cold solder joints, and solder splashes. Another common trouble is blown transistors and IC's due to reverse polarity or power line transients. Remember if you encounter problems during initial testing that it is easy to install parts in the wrong place. Don't take anything for granted. Double-check everything in the event of trouble.

Unlocked

Case1: In case of LCD display is Unlocked, the LED LOCK on board not illuminates and relay not active. You can check to frequency is correct or not by the ways as:

Measurement signal lock detect as picture below:

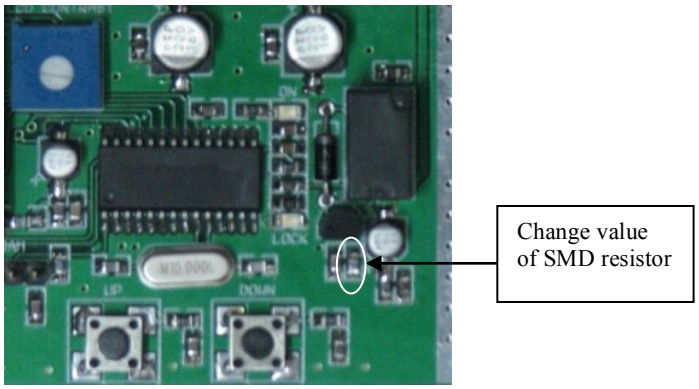


If the voltage value about 4.5-5.0V, The PLL is locked.

If the voltage value less than 4.5V, The PLL is unlocked.

In case of unlock, the semiconductor on transmitter have broken. You will check all part in PLL section and change a good part instead.

Case2: In case of the PLL is locked and LCD display is Unlocked, the LED LOCK on board not illuminates and relay not active. You can change the SMD resistor as picture below:



You can change the value of SMD resistor between 2.49Kohm to 10Kohm. This method help to relay and microcontroller easy to measurement locked signal while transmitter it on, but you should have lock and unlock relay when you turn on the transmitter.

Current Drain

Power line current drain normally is about 800 mA with full RF output. If the current drain is approximately 800 mA with no RF power output, check to see if voltage regulator is hot. If so, and the voltage on the 15V and 5V line is low, there is a short circuit on the somewhere. If you clear the short circuit, the voltage should rise again

Hum and Noise

The VCO and loop filter are very sensitive to hum and noise pickup from magnetic and electrical sources. Some designs use a shielded compartment for VCO's. We assume the whole board will be installed in a shielded enclosure, so we elected to keep the size small by not using a separate shield on the VCO. However, this means that you must use care to keep wiring away from the VCO circuit at the right side of the board. Having the board in a metal enclosure will shield these sensitive circuits from florescent lights and other strong sources of noise. Because the frequency of a synthesizer basically results from a free running LC oscillator, the tank circuits very sensitive to microphones from mechanical noise coupled to the coil. You should minimize any sources of vibration that might be coupled to the transmitter, such as motors. Excessive noise on the dc power supply that operates the transmitter can cause noise to modulate the synthesizer output. Various regulators and filters in the Receiver are designed to minimize sensitivity to wiring noise. However, in extreme cases, such as in mobile installations with alternator whine, you may need to add extra filtering in the power line to prevent the noise from reaching the transmitter. Other usual practices for mobile installations are recommended, such as connecting the + power and ground return lines directly to the battery in-stead of using cigarette lighter sockets or dash board wiring.

