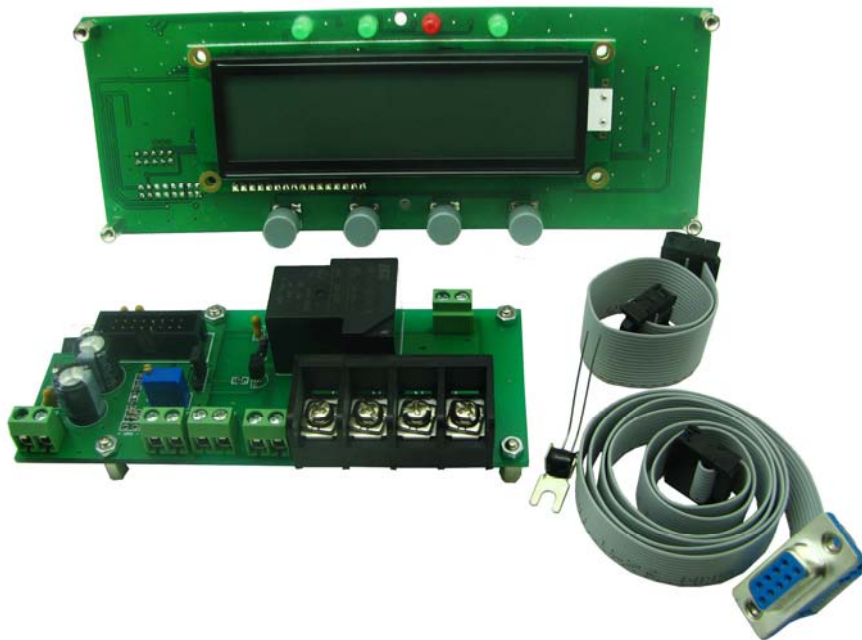


# *LCD Wattmeter*

*Model: LCD-5000*



# *User Manual*

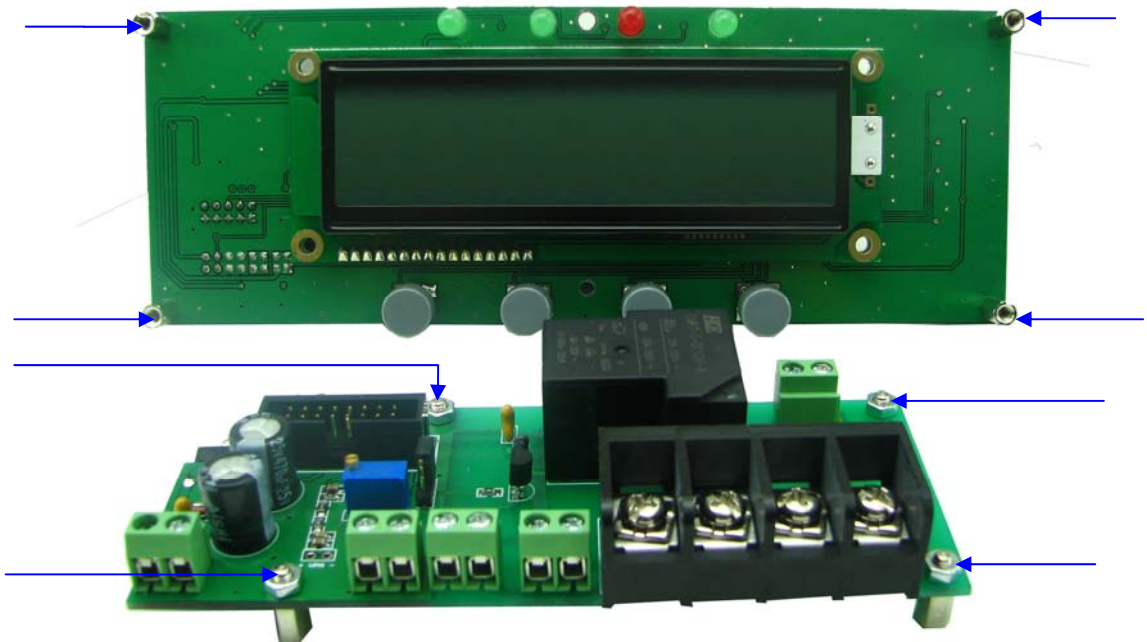
## CONTENTS

### **General Information**

The LCD-5000 is the latest in a series of FM monitor for demanding applications. It is especially suited for FM power measurement, and protection control. The LCD-5000 was designed to provide in the FM/TV application.

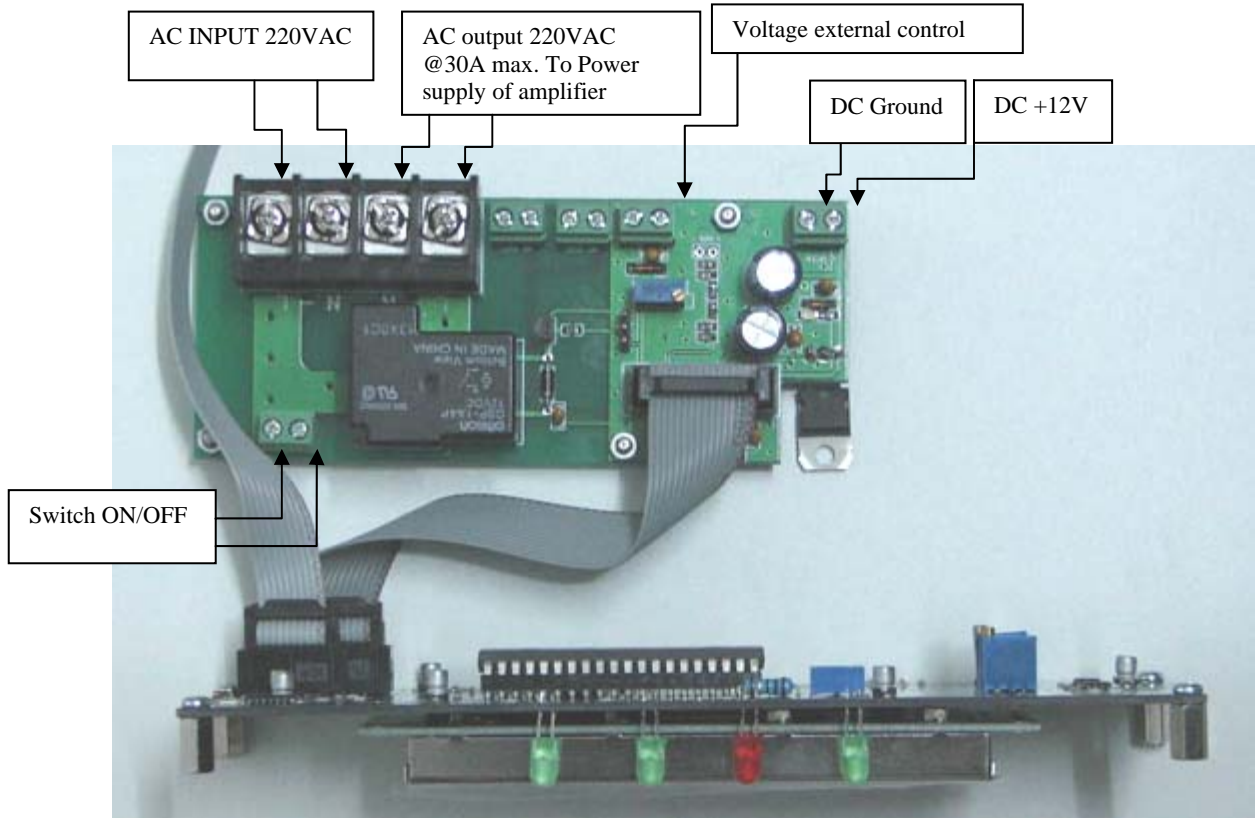
### **Installation Mounting**

Some of support should be provided under the PC board, generally mounting the board with 4 holds of LCD panel and 4 hold of control. The monitor board relies on the mounting hardware to provide the DC and ground connections to the ground plane on the board.

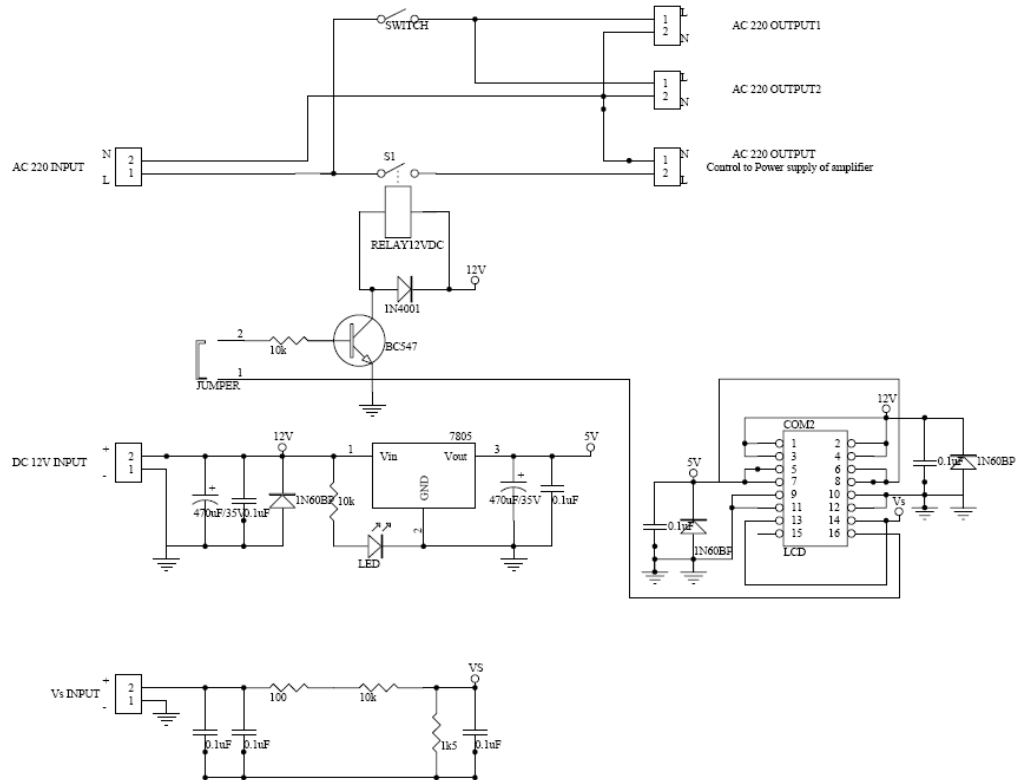


### **Electrical Connections**

Power supply should be connected to the connector on the monitor board with #4 wire, which can be extended to a connector or feed through capacitors used on the cabinet in which it is installed. The monitor board operates on +12.0 – 15.0 Vdc at about 200 mA. 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 monitor can be damaged.

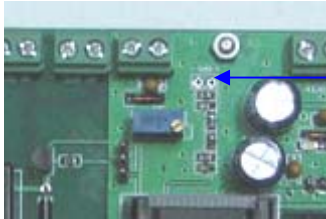


**Schematics Connections**



**Voltage (Volt) measurement Connections**

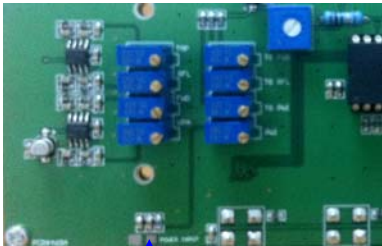
You can connect to monitor board as.



+Vs measurement connection

**Power input (Pin) measurement Connections**

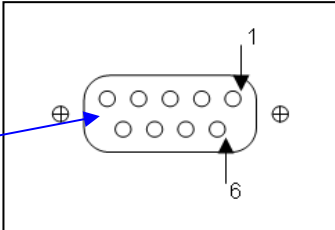
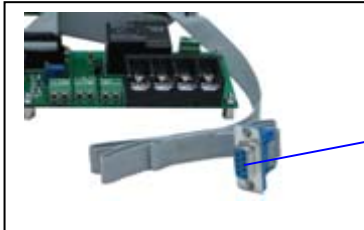
You can connect to monitor board as.



Power input measurement connection

**Forward (Fwd), Reflect (Rfl), Temperature (Temp) measurement Connections**

Type: DB9 female

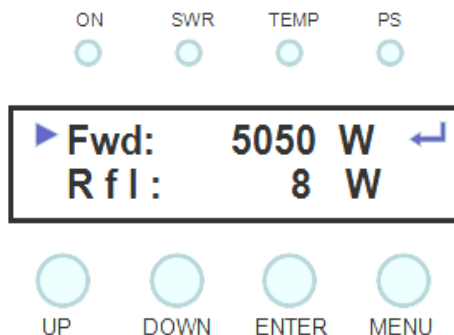


- 1 GND
- 2 GND
- 3 GND
- 4 GND
- 5 GND
- 6 Forward from directional coupler
- 7 Reflect from directional coupler
- 8 Temp+ (connect to thermistor 150K +)
- 9 Temp- (connect to thermistor 150K-)

## Operation

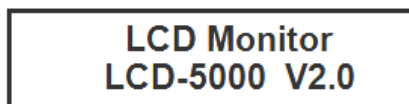
### Button Menu

Front of LCD panel is show and display as:



### Turn on

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



\*\*\* The banner can be set as your request. Please contact to our factory. \*\*\*

Then the LCD will display as:



\*\*\*Fwd and Rfl value will display depend on the measurement from directional coupler.

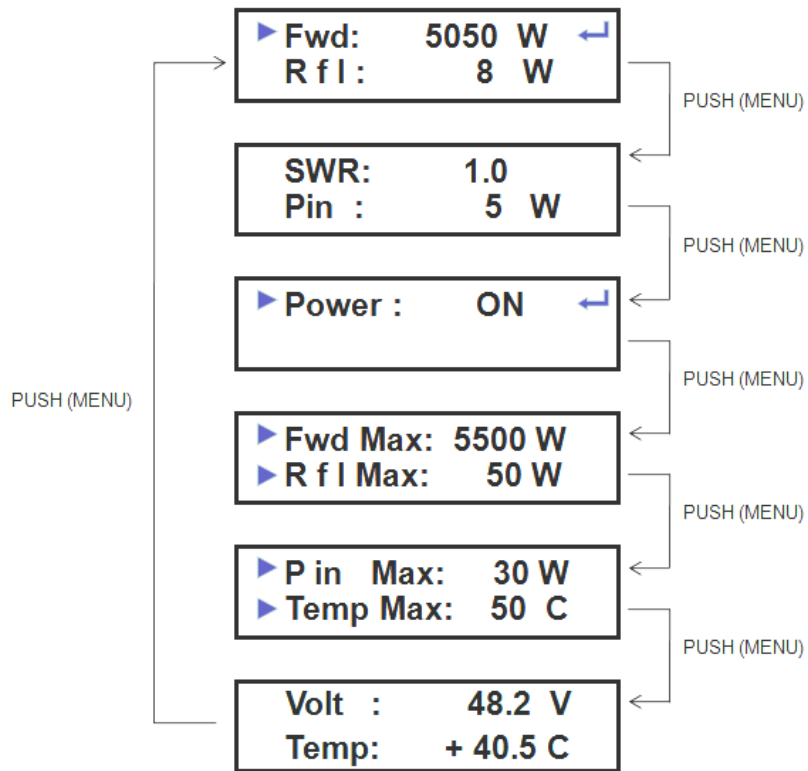
### Front panel control

The LCD panel is provided with a two-line LCD display where a set of menus is shown

When turned on, the LCD display shows the predefined screen with the graphic representation of the direct power supplied:

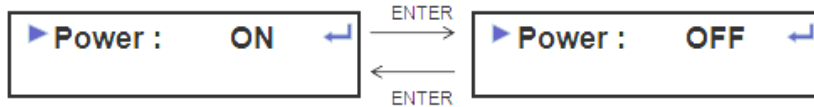


To change the display, select the MENU push button, the screen that is shown in following:



**Relay Power ON/OFF**

To change the relay power ON or OFF, select the menu power as below,



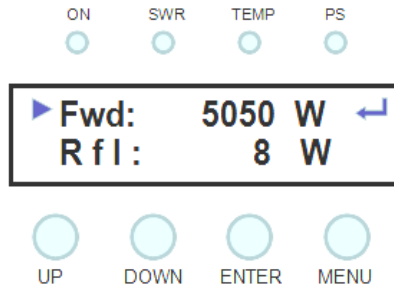
**Output Voltage External Control**

To external control such as power supply, bias and etc. The voltage external control can be adjusted from 0 to 10 volt (@100mA max) by front panel. Select the menu power set as below,



### LED indicator

Front of LCD panel is show and display as:



LED **(ON)** light when the board is working

LED **(SWR)** light when the high of VSWR measurement (the value of RFL more than RFL max or RFL more than FWD, the relay will be OFF)

LED **(TMP)** light when the high of temperature measurement (the value of temperature more than 50 Celsius and relay will be OFF)

LED **(PS)** light when the low voltage measurement (the value of voltage less than 5 volt)

### Limit and Protection

The module will be control and monitor by software in CPU, so that the value of limit to control and protection by

FWD value, the maximum of FWD limit set by value of FWD MAX

RFL value, the maximum of RFL limit set by value of RFL MAX

Pin value, the maximum of Power input limit set by value of Pin MAX

TMP value, if the TMP measure more than 50 Celsius

These Alarm and protection thresholds are preset by factory as:

Forward power maximum (FWD MAX) = 5500 W

Reflect power maximum (RFL MAX) = 50 W

Power input maximum (Pin MAX) = 30 W

Temperature maximum (Temp MAX) = 50 C (set by factory)

Then you can set the value for protection by yourself as:

Forward power range (FWD MAX) = 10-5500 W

Reflect power range (RFL MAX) = 1-200 W

Power input range (Pin MAX) = 1-200 W

### Alarms

There are four type of fail that can cause a relay power OFF and re-start

- Over Forward power



The values of forward power output more than the value of FWD MAX. The relay is OFF and re start.

- Over SWR

**!!! ATTENTION  
Over SWR**

The output load is short or open. The relay is OFF and re start.

- Over Reflect power

**!!! ATTENTION  
Over RFL**

The values of reflect power output more than the value of RFL MAX. The relay is OFF and re start.

- Over Temperature

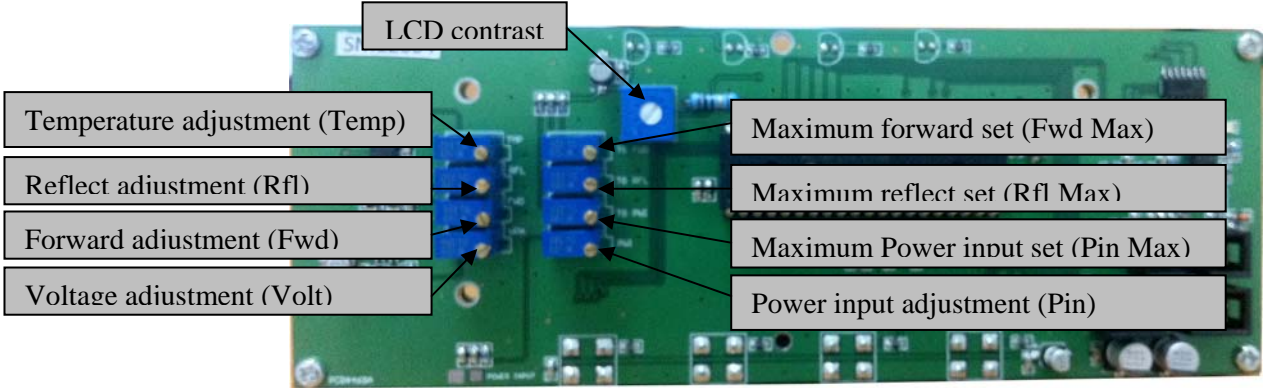
**!!! ATTENTION  
Over TEMP**

The values of temperature more than Temp MAX. The relay is OFF and re start.

**Adjustments**

**LCD measurement adjust**

The value of measurement can adjust for correction by potentiometer from rear of panel as below.



**Output voltage control adjustment**

