

User Guide rev.2

20 Band Audio Spectrum Analyzer

V2.1

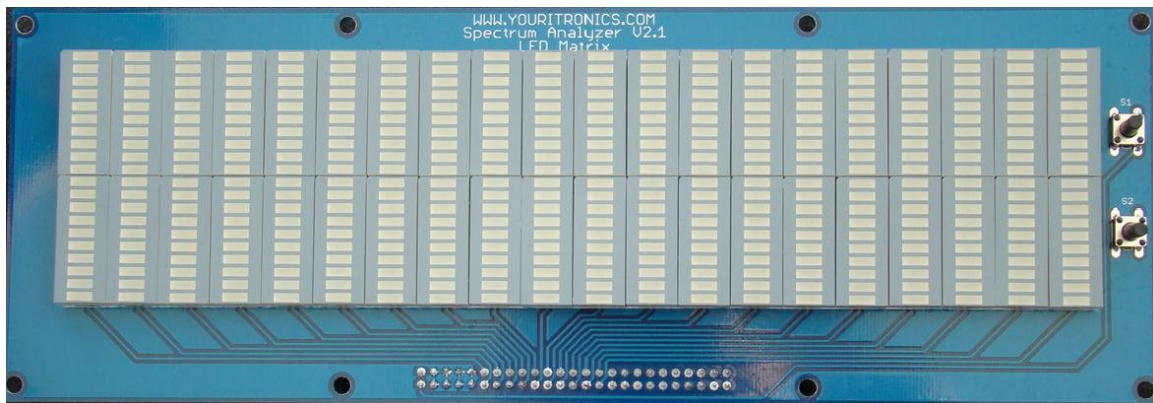


Table of Contents

Description	2
Introduction.....	2
List of abbreviations.....	2
Main processing unit.....	2
Specifications and features.....	2
Getting started	4
Preloaded firmware	4
Making the connections	4
Making adjustments	5
Warranty.....	7
Copyright.....	7

Description

Introduction

Congratulations on your purchase of the Audio Spectrum Analyzer V2.1. The kit is designed to enhance the visual effect of any audio player or entertainment system by actively analyzing the played audio spectrum and displaying the result on a 20x20 LED display matrix.

List of abbreviations

These are some of the abbreviations that will be used on this document:

kit	=	the audio spectrum analyzer
VDC	=	volts direct current
ISP	=	in system programming

Main processing unit

The ATmega64 is the main processing unit of the audio spectrum analyzer V2.1. It is a high-performance, low-power AVR® 8-bit microcontroller.

Specifications and features

These are the main specs & features of the audio spectrum analyzer v2.0:

- 20 analyzed bands (100 Hz - 162.1 Hz - 224 Hz - 286.3 Hz - 348.4 Hz - 410.5 Hz - 472.6 Hz - 596.8 Hz - 721 Hz - 845.2 Hz - 1031.5 Hz - 1155.7 Hz - 1342 Hz - 1590.4 Hz - 1900.9 Hz - 2521.9 Hz - 3515.5 Hz - 5068 Hz - 8048.8 Hz - 15997.6 Hz)
- 20 signal levels (0V - 0.02V - 0.04V - 0.06V - 0.08V - 0.10V - 0.12V - 0.14V - 0.16V - 0.18V - 0.20V - 0.22V - 0.24V - 0.26V - 0.28V - 0.30V - 0.32V - 0.34V - 0.36V - 0.38V)
- 20x20 display matrix composed of Kingbright LED bargraphs for better build quality and greater luminosity
- input voltage from 6 to 12 VDC 1A through 2,1 mm DC jack center pin positive (onboard dc-dc converter)
- input signal level can be adjusted through the onboard pot
- input signal level accepted from 200mV to 4V
- 9 display modes available (selectable through switch 2 present on the display board)
- on/off (standby) control selectable through switch 1 present on the display board.

- ATmega64 as the main processing unit running at 8 MHz
- programming of the unit is done trough ISP
- connecting mode: the two boards can be either connected by wire or back to back
- dimensions assembled : motherboard 100x80x37 mm , display matrix board 232x80x34 mm , both back to back 232x80x44

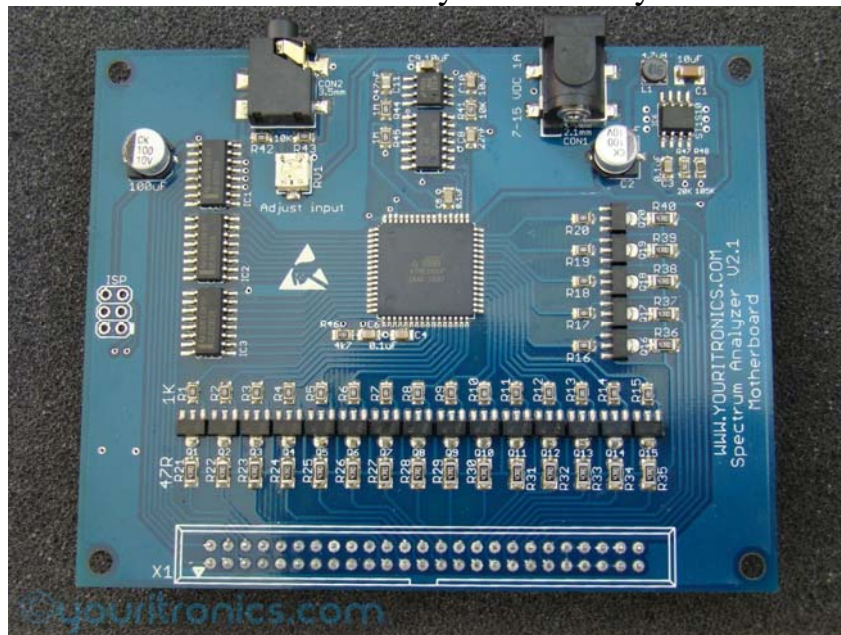
Getting started

Preloaded firmware

The Audio Spectrum Analyzer V2.1 comes with preloaded firmware so it works right out of the box. The firmware is final and it was fully tested thus there is no need for future updates.

Making the connections

1. Depending on which connection method you choose for your order, you will have to connect the two boards (motherboard and display board) back to back or by cable.
2. The next step is to connect a signal cable from your audio source to the 3.5mm stereo input jack available on the motherboard.
3. The final step is to connect the power adapter to the DC power connector present on the motherboard. Remember to use a good quality power adapter 7-12 VDC, 1A. It is best to get the power adapter from the online shop together with your spectrum analyzer because it's a high quality power adapter (SMPS mode) and it ensures the output voltage is always constant. If you chose to use your own power adapter beware of older models (transformer type) which often output 3-5 times their rated voltage for the first milliseconds when plugged in and will damage your spectrum analyzer for sure. This situation is not covered by the warranty.



Although the kit was not originally designed to be installed in a car system, the onboard voltage regulator can handle the **12 VDC** from a car battery and it can be installed if you follow basic safety requirements. Special care should be taken by installing a **1A fuse on the positive line**. If you don't have any previous experience or qualification you should have your kit installed by a professional.



A standard 19mm blade fuse holder is available in the online shop and it comes with two 1A 32V rated fuses. These are recommended when connecting the spectrum analyzer to car battery.

Making adjustments

Because of the various devices that output various signal levels you might need to adjust the sensitivity of the kit to get the display filling from top to bottom. This is done through the potentiometer located on the motherboard. When it's shipped the board will have its potentiometer set for an input signal of 300mV which is compatible with most devices like, iPods, iPhones and most of the portable mp3 players.

If you want to connect the kit to a device that outputs more than 300mV you should set your device volume around 90% and rotate the pot to the right until the display fills up all the way to the top but still allow the bars to go

down. This might sound complicate in theory but you should find it rather easy in practice.

Note: Avoid setting the pot to a maximum right because in some cases it will make your spectrum analyzer display fill up with noise, so always leave a small margin when turning it to the right.

After you have adjusted the input level you can toggle through the various display modes with switch 2 from the display board. There are 9 display modes available, chose the one you like and as long as the kit remains powered it will remember the last mode used and it will use it on every start-up. If the kit is left un-powered it will not remember the last mode used and it will start with mode no.1.

Copyright

It is not allowed to copy the board or the source code in any form. The main processing unit has a programming lock feature that will make any attempt to read the program flash memory impossible. It is also prohibited to copy this user guide or parts from it.

Warranty

Youritronics warrants this product to be free of defects in parts and workmanship for one year from date of purchase. Youritronics will at its option, repair or replace or refund the purchased price of goods found to be defective. The warranty does not apply to defects resulting from action of the user such as misuse, improper wiring, operation outside of specification, improper maintenance or repair, or unauthorized modification.

The warranty does not apply to unassembled kits due to improper handling that might happen. This warranty also does not cover problems appearing when the spectrum analyzer is used with power adapters other than the ones sold in the online shop.

In no event shall Youritronics be liable for direct, indirect, incidental or consequential damages in connection with goods sold or any part thereof.

For any questions please don't hesitate to contact us:

www.youritronics.com
contact@youritronics.com

If you would like to share pictures, videos about your custom setup or check what others have done you can do it on the forum:

<http://www.youritronics.com/forum/>