Angular Clock

A great new way to tell the time. The Angular Clock uses three voltmeters to tell the time, and its hackable. **Available for purchase here** and **source code and meter faces available here**.

Assembly time: About 45 minutes

What you need: Phillips screwdriver, small flat screwdriver and wire strippers. No soldering required.

What's in the box:

A. Enclosure cutouts
B. Angular clock circuit board
C. Power supply
D. Three Voltmeters, and three small screw packets
E. 3 Clock faces, and an extra blank face
F. Ribbon Cable to connect the meters to the circuit board
G. Time adjustment knob
H. Mounting hardware – 16 nuts and 12 screws

Assembly Overview

The basic idea is to mount the circuit board onto the base, assemble the rest of the enclosure and then put the base and the rest of the enclosure together. Details below.

Clock Startup Sequence

Once assembled and powered up, the clock goes through the following startup sequence.

A. The red and green LEDs on the controller board alternately flash 5 times.
B. The three meters sweep all the way to full deflection (right) and back to zero deflection (left).

Once the startup sequence is complete the clock will start displaying time.

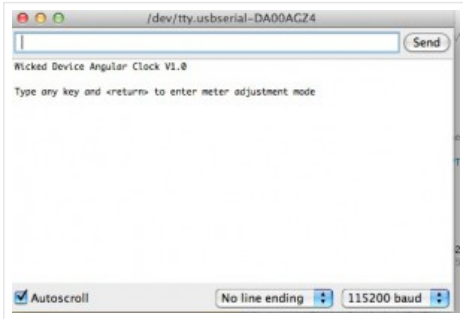
Time Adjustment

The time displayed on the meters can be adjusted using the knob on the rear of the clock. Turing the knob clockwise or counterclockwise moves time forward or backward. While time is being adjusted forward the green LED will illuminate, the red LED illuminates while time is being adjust backward.

Clock Meter Adjustments

You can adjust needle deflection alignment for the hour and minute meters using the following procedure. Start a serial monitor program such as the monitor built into the Arduino IDE. Set the baud rate to 115,200. When the clock starts up it will output the following messages to Arduino serial monitor. (Serial monitor tutorial)

While the Arduino is going through the startup sequence type any character followed by carriage return into the serial monitor. You will then be prompted to use the knob on the rear of the clock and adjust the hour and minute meters to specific locations. These meter adjustments are stored in nonvolatile memory and therefore only need to be performed once.



FREE SHIPPING TO THE USA FOR ORDERS OVER $25

AIR QUALITY EGG INTEREST SURVEY

Air Quality Egg
Display LED LCD
Kits and Assembled Projects
Microcontroller/Arduino
New Products
Parts and Accessories
Robots
Sensors
Shields and Add-ons
Uncategorized
Wireless links

LATEST BLOG POSTS

Office painting
Egg: Getting the data out
Egg Version One End Of Life
Egg Firmware Update Today
Air Quality Egg: Offline Mode FTW!

TUTORIALS

MintyTime
Day Counter
Nanode Gateway/Remote

FORUMS AND BLOG

Wicked Device Blog
Forums. Get help!

ABOUT AND CONTACT US

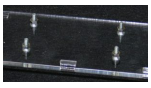
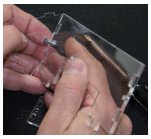
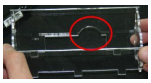
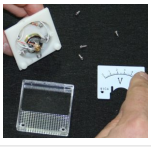
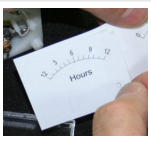
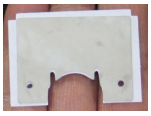
About Wicked Device

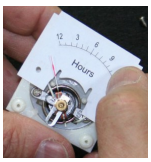
Wicked Device LLC
95 Brown Rd, Suite 154
M/S 1042
Ithaca, NY, 14850
email us

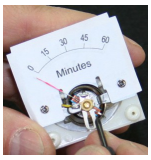
Battery Backup

The clock has a slot for a cr1220 3V battery. This battery will allow the clock to maintain time if powered off, for instance during a power failure.

Assembly – Step by step instructions:

Image	Description
	Peel off the paper backing from the plexi.
	Insert the screws into the base, and secure with a nut on top. Finger tighten the nut
	Add the PCB, and secure with more nuts. Finger tighten.
	Onto the rest of the enclosure. Assemble the 4 four sides.
	Make sure the cutout for the adjustment knob is on the right side. On the right looking at the front of the clock.
	Remove the meter covers.
	And the meter faces. Be careful not to bump the meter needle. It is somewhat delicate.
	Here are all the parts for the meter.
	Stick the labels for Hours, Minutes and Seconds over the top of the meter faces. Don't fold the tabs over.
	Here you can see that the new faces are larger than the meter faces. **Do not** fold the tabs over.
	Slip the face back under the needle from the top.





Let's take the chance for a quick adjustment.
Here we can see that the needle for the meter is not lined up to the "0". You can move it by pushing the silver bit of metal below the axle. This will move the needle.

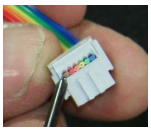
There. It is nicely aligned to the zero.

Now cram the cover on. This will fold the tabs over.
add the labels to all three three meters.

Insert the meters into the plexi cover.

Each meter has a small bag of screws and hardware.
Screw in a washer and a nut on each post.

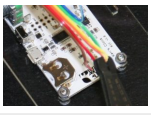
Great! The back of the face panel is done.
We are more than half way!



Next the ribbon cable. The screwdriver indicates pin 1, the leftmost (+) seconds position. Counted this way, odd numbered wires are (+) and even numbered wires are (-) connections. Left to right as pictured, it's seconds (+), seconds (-), minutes (+), minutes (-), hours (+), hours (-). **NOTE**: Cables are different colors. Don't rely on cable color.
We used colors so the pictures are easy to understand.

Plug the cable into the board as shown.

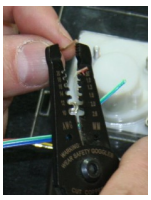
Here it is plugged in.



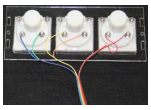
Now separate out the individual wires

Three pairs, each with two wires.

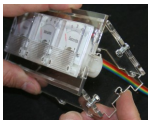
Strip the wires.



Wrap them around the posts. Use the washer and a nut to secure.

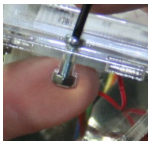


Here we can see the cables.

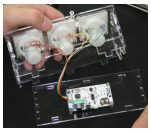


OK. Put the top onto the rest of the enclosure.

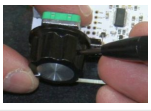
Here is a technique to hold the nuts in place.



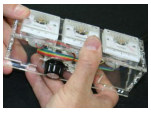
Drop the screw in from the top and tighten it up.



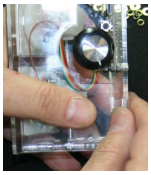
This is what it should look like



Add the adjustment knob. It has a small grub screw to keep it in place. That should screw against the flat side of the post.

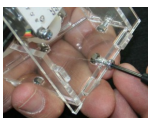


Add the bottom on.



Here we are putting the tabs in.

The final two screws are harder than the others. Hold the clock vertically, and use gravity to help, as shown.



Insert the screw, and tighten.

Done! Congratulations!