

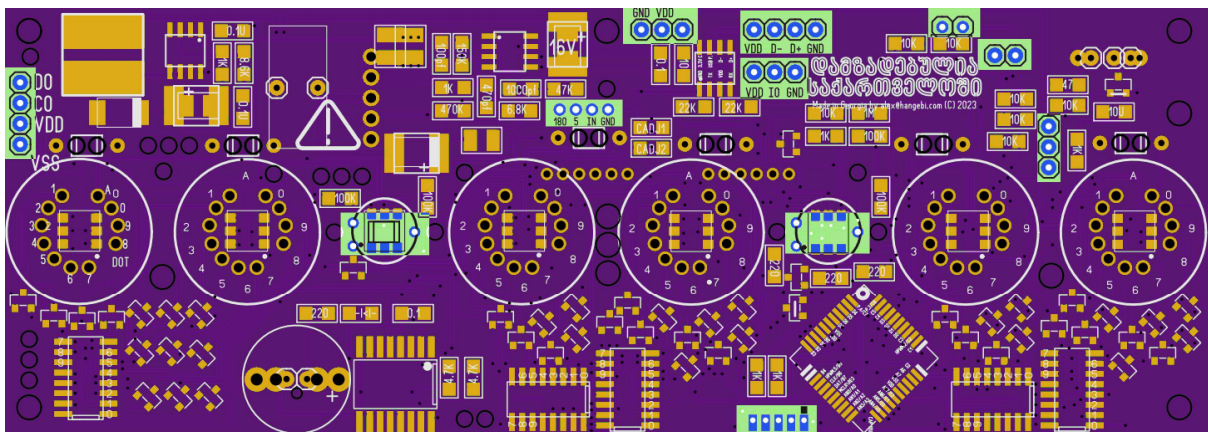
MIGHTY-8

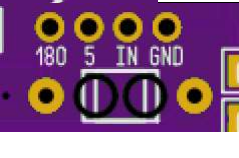
Nixie clock kit assembly guide

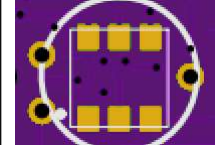
Welcome to the assembly guide for Mighty-8 kit. If you have already purchased our previous kits, like Mighty-6, you will be already familiar with the most of controls and assembly guides. If you have not, then please read that guide first (<https://www.tiktoki.ge/projects/Mighty6/kitmanual.pdf>), as this document is mostly update to the previous manual for the new features, and the “old” manual provides all necessary information about physical assembly of the clock.

The main differences between Mighty-6 and Mighty-8 are minimal, there is added support for certain new features, such as ambient light control, terminal connection, GPS and so on. Physically, mounting hole layout, LCD screen and button placement and tube locations are the same, so if you have designed your custom enclosure for the previous revision, you can safely re-use them with this new PCB.

Below is the description of connectors available on the clock main board (please note, some of them are optional and depend on features you’ve ordered).



	This is the connector for the ambient light/night light accessory, it might not be available in your particular PCB revision. If it is available, for more details you can refer to accessory user manual.
	There are voltage control test points and usually used only during the QC check/Calibration once PCB is assembled. If you curious, you can use multimeter to check the voltages here.
	This is the main power connector. There is GND and two VDD connectors. These two should be tied together (most likely they already are). Operating voltage is 5V DC. Please, do not exceed that voltage, because that will permanently damage the clock. Power voltage can be lower – clock can safely operate in range of 4-5V DC.
	These are (optional) USB connector pins. These are used for debugging and for built-in terminal operation. If you have not ordered board with built-in terminal, this connector has no use. If you ordered that feature, you can solder USB header/cable there and use it for PC connection (you still need to provide separate 5V supply for clock, because USB port power is not enough to power the whole clock) The USB port requires no drivers and you can connect to the built-in terminal with any terminal software (Refer to user manual for the terminal commands)
	This is the GPS module connection port. It accepts any NMEA compatible GPS module data, with default speed of 9600BPS. Clock has been fully tested with GPS Neo 6 V2 modules. By default, there's a jumper connecting IO pin and GND pins. Do not remove it, if you have no plans to use the GPS module.
	These two connectors are for button testing during the QC check, Also, you can connect external buttons here, if you decide to not use the built-in ones. Connect one button directly to one of these connector, and use 10K resistor in series with another for the 2nd one.
	This is MP3 player connector. Keyes/DFplayerMINI type of modules are supported. MP3 feature support is firmware dependent, so if you have not ordered that feature, there's no need to connect module there – it won't work anyways.

	These are separator dot connection pins. These boards support dual or single separators on each side. The bottom leftmost pin is the common cathode and other two pins are separate anodes – if you plan to use dual dot separators, connect them together at cathode end, but use separate anode connection to provide even and stable operation. If you're going to use single tube separator, then connect it's one pin to any of the anode pins and 2nd pin to cathode pin.
	This is firmware update port and usually, end user has nothing to do with it.

Tube installation.

Most PCB connectors are on the back side of the clock, so install tubes with their faces facing the opposite end. Tube installation is easy, just insert them to the appropriate holes. The PCB pictured above, is for IN-8-2 tubes. These tubes come with extra long legs, so putting them into the holes should not be a hard thing to do. Kindly note, the 4th pin at the right (when looked from above) is not soldered, because this pin is for dot connection, which is not used in this particular PCB design.

Tube soldering is simple – put all the pins of all the tubes thru appropriate holes, attach the TITS (Tube Installation Taper System) to the PCB and put tubes thru it, to align them properly and solder them only after that, because if you solder tube slanted, it will be quite hard to unsolder the tubes without damaging PCB. In case of damaged tube, to remove it without damaging the PCB, twist it around in left and right directions, until the legs will break off, and then de-solder the legs individually.