

User Guide

PortaStation



About Our Company

Innove Workshop Company (IWC) is a dream coming true, after many years making hobby electronics projects in a small computer desk at home dreaming of one day being able to transform our ideas into actual products, the opportunity to open a business finally arrived and with it the possibility to put into practice all that we had planned all these years.

We have a passion for engineering, innovation, and technology. We are always in a constant search for better ways to achieve our goals, think outside the box, simplify things, and develop innovative solutions.

To achieve the highest level of quality possible all our products are handmade, with care and a lot of attention to detail, in order to make sure that when you receive your order you'll be receiving something unique.

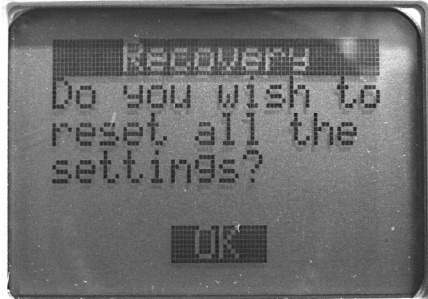
Specifications

Dimensions (WxHxD)	104mm x 57mm x 144mm
Weight	340g
Supply Voltage	24V
Current Consumption (Idle)	20mA
Current Consumption @ 100% DC	4.2A
Soldering Temperature Range	220°C to 450°C
Resolution	1°C
Main Controller	TI MSP430G2553
Display	84x48 Graphic LCD (PCD8544)
Soldering Iron	Hakko 907 (24V 50W)
Power Input Connector	2.1mm x 5.5mm Barrel Jack

Supply Voltage Warning

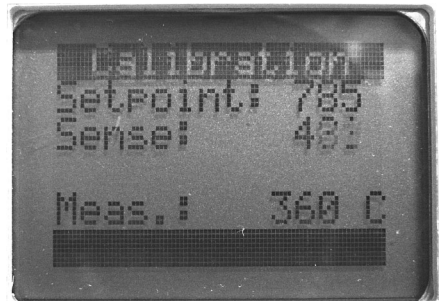
The nominal supply voltage for operation is 24V, with a maximum rated voltage of 25V, this is a limitation of both the components inside and the fact that what the unit is switching the input voltage directly to the soldering iron heater, without passing through a regulator or any kind of limiting circuit. The safe operating voltage range would be from **20V up to 24.5V**, which makes the unit perfect for being powered from a **6S lithium battery pack charged up to 4V** maximum, which is our recommended battery pack for the unit.

Recovery Mode



This product was designed to be robust and never fail, but sometimes bad things happen and unfortunately the EEPROM might be corrupted for some strange reason. If this happens or you just want to reset all your settings to the factory defaults you can enter this mode by **holding the rotary encoder while powering the unit ON**. After this message appears just click the knob again and you should see the splash screen with a "DL" at the bottom left corner indicating that the EEPROM is being re-written.

Calibration Mode



If you want to use your own soldering iron instead of the one your PortaStation came with or just want to make sure your iron is well calibrated you can always calibrate it by using the wizard located in

the **Calibration menu**.

To determine the temperature the software in your unit does a simple linear interpolation to find a approximate Temperature/ADC value function using two points.

Working Mode

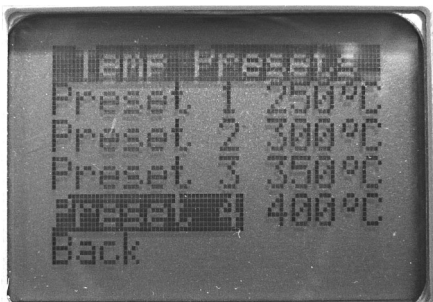


This is the mode you'll spend most of the time in, the screen is designed to show you the maximum amount of information that might be of your interest. On the top you'll see the current power being drawn by the unit together with the input voltage which is handy if you're operating the unit from batteries. In the middle you have your set temperature and the actual temperature the tip of the iron is at. All this is followed by a bar at the bottom which represents the amount of power being sent to the heating element.

General Operation

While in the main screen you can set the desired temperature easily by **rotating the knob** or by **clicking it** to switch between your saved presets, which can be changed in the *Temperature Presets* menu. To access the menu all you have to do is **hold the knob down for approximately 2 seconds**.

Working with Presets



Temperature presets make this product a joy to work with. Most of the time we are soldering we set our iron to the temperature we feel most comfortable to work and do the majority of our soldering at this temperature, but sometimes we have to switch to a lower temperature in order to not risk damaging a sensitive component or increase it to solder something with a large thermal mass like a connector. Because of situations like this we have 4 temperature presets which can be changed to whatever value you desire and can be easily be **switched in the main screen by pressing the knob for a brief moment**.

To change the value of your presets just go to the settings menu by holding the knob in the main screen, selecting the **Temperature Presets** menu, choosing which preset to change by clicking the knob. When the temperature value on the right side is underlined you can set that preset to the desired value by rotating the knob just like you do to change the temperature. When you're finished click the knob again to store that value, go back to the main menu and save the settings.

Calibration Process

As it was previously discussed in the *Calibration Mode* section of this manual the unit uses two points of data to perform a linear interpolation to determine the appropriate temperature function for your specific soldering iron. To make this a much simpler process you can access the **Calibration Wizard** located in the **Calibration Menu**.

After launching the wizard the unit will control the heating element of your iron until a specific setpoint in ADC units is achieved, when you determine that the temperature has stabilized you'll **measure the temperature** at the tip of the soldering iron and set it by **rotating the knob** until the *Meas.* field reflects the value you've measured. **Clicking the knob** stores that value. You'll have to perform this process two times.

To perform this measurement you can use a dedicated thermometer like the Hakko FG-100 to get a more accurate result or measure using a thermocouple held against the tip of the iron.

After you've set the two temperature values a confirmation screen will be shown just as a reference and the values will be stored in the device's memory. After this the unit will come back to the main screen and will already be working with the new calibration values.

If you want to tweak the values you can easily do it by going to the *Calibration Menu* and changing each of the *Calibration Variables* manually the same way you changed the temperature presets.

Changing Units



PortaStation was designed to be used all around the world. To accommodate the fact that some countries use a different unit for temperature we've made it so that you can easily change them in the **Units Menu**, just select the one you wish. You can even use Kelvins if you're feeling fancy.

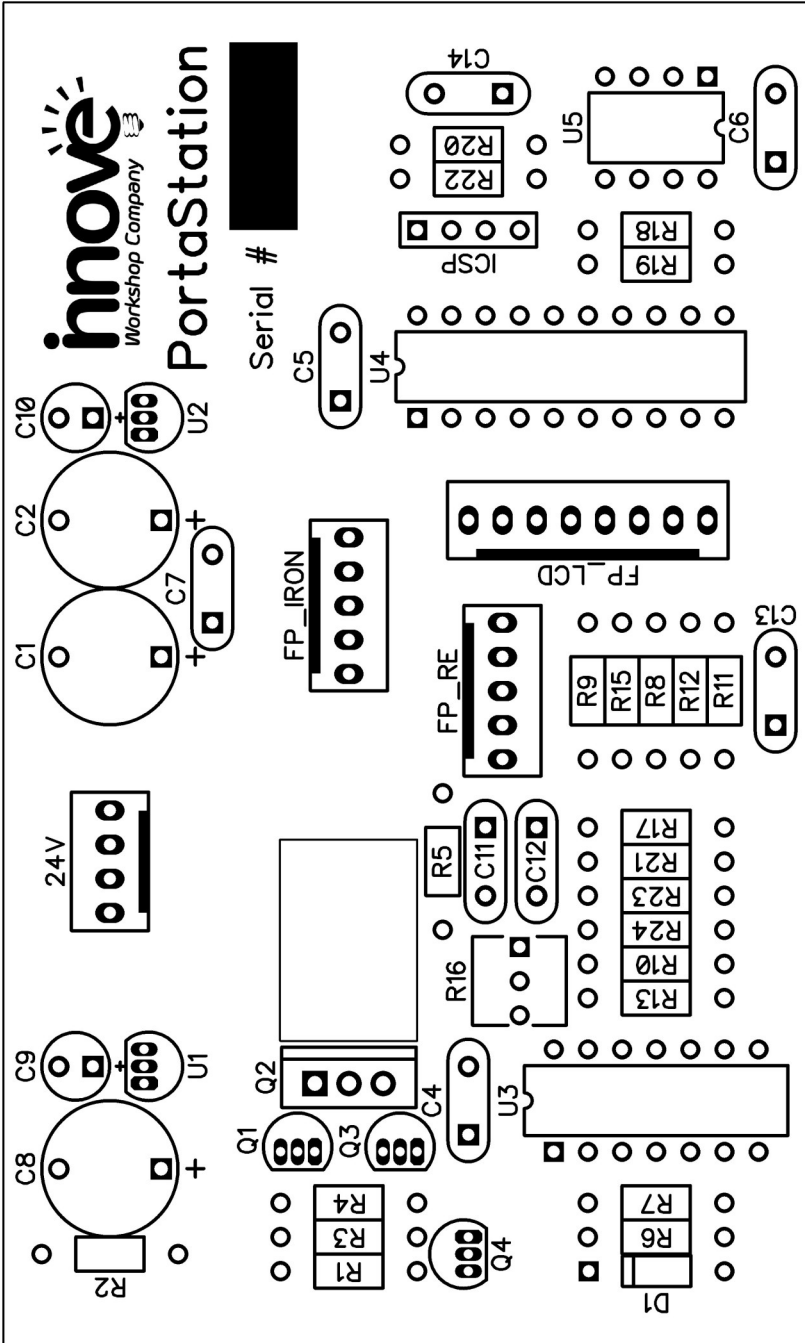
Hacking

Our products are licensed under the **Creative Commons Attribution -NonCommercial-ShareAlike 4.0 International License**, so you're free to have a lot of fun hacking it to your heart's content! In our website you can find the full schematic diagram, board layouts, binaries and the source code. Everything is available at:

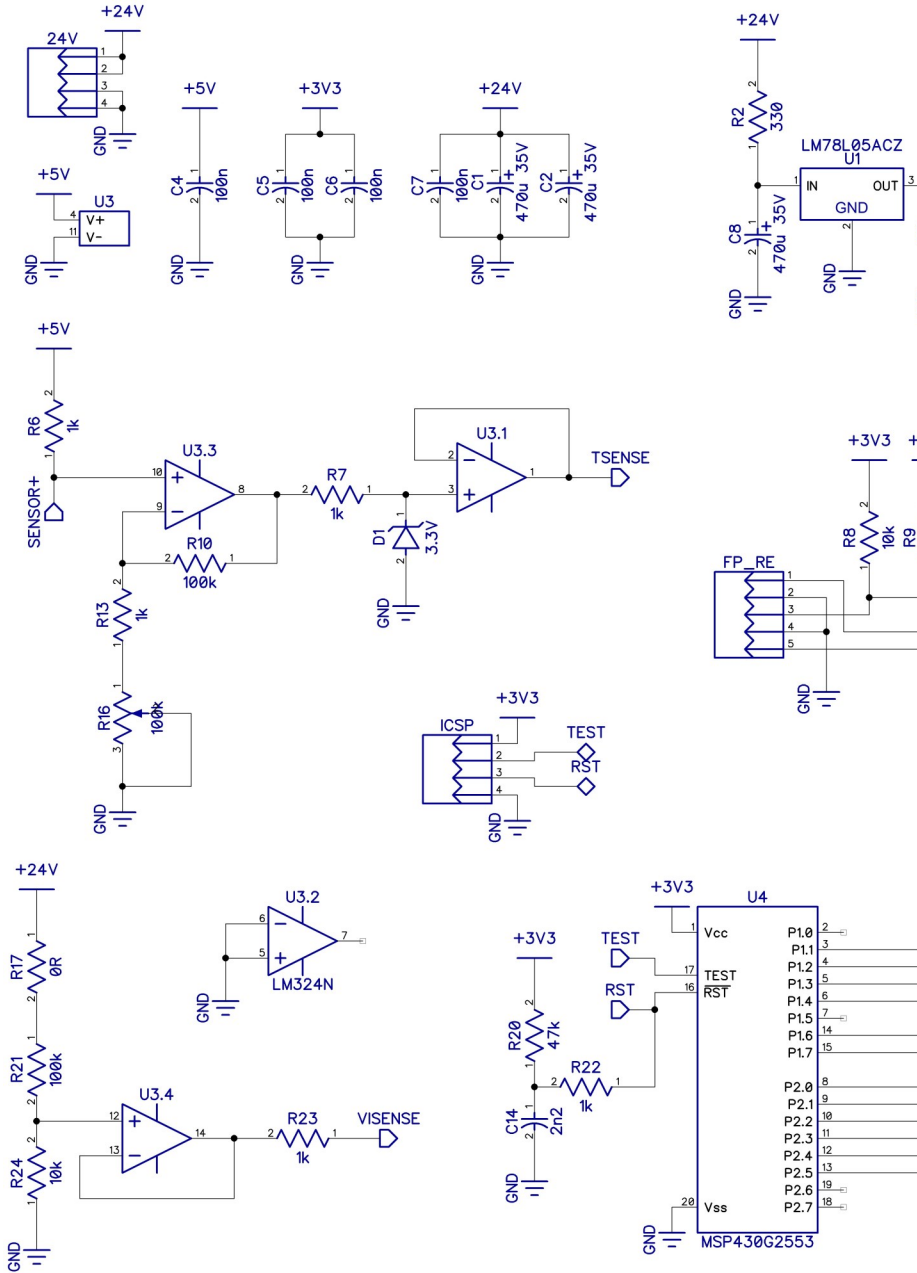
<http://innoveworkshop.com/en/product/portastation>

If you are having any trouble and want some help in your hacking endeavors, feel free to contact us at contact@innoveworkshop.com and we'll be happy to help you out!

Board Layout (Component Placement)

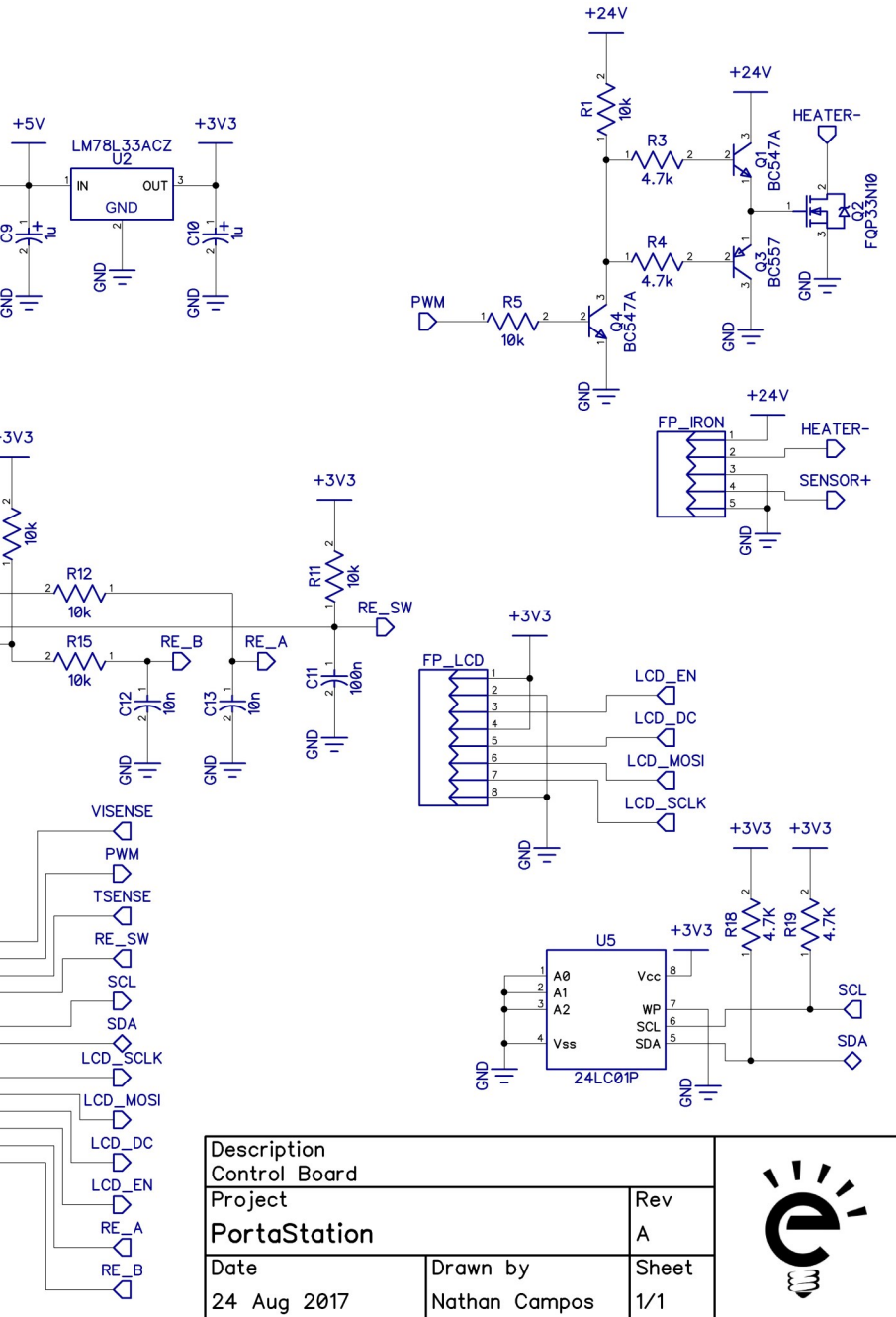


Hacking



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Schematic Diagram



Description Control Board		
Project PortaStation		Rev A
Date 24 Aug 2017	Drawn by Nathan Campos	Sheet 1/1





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