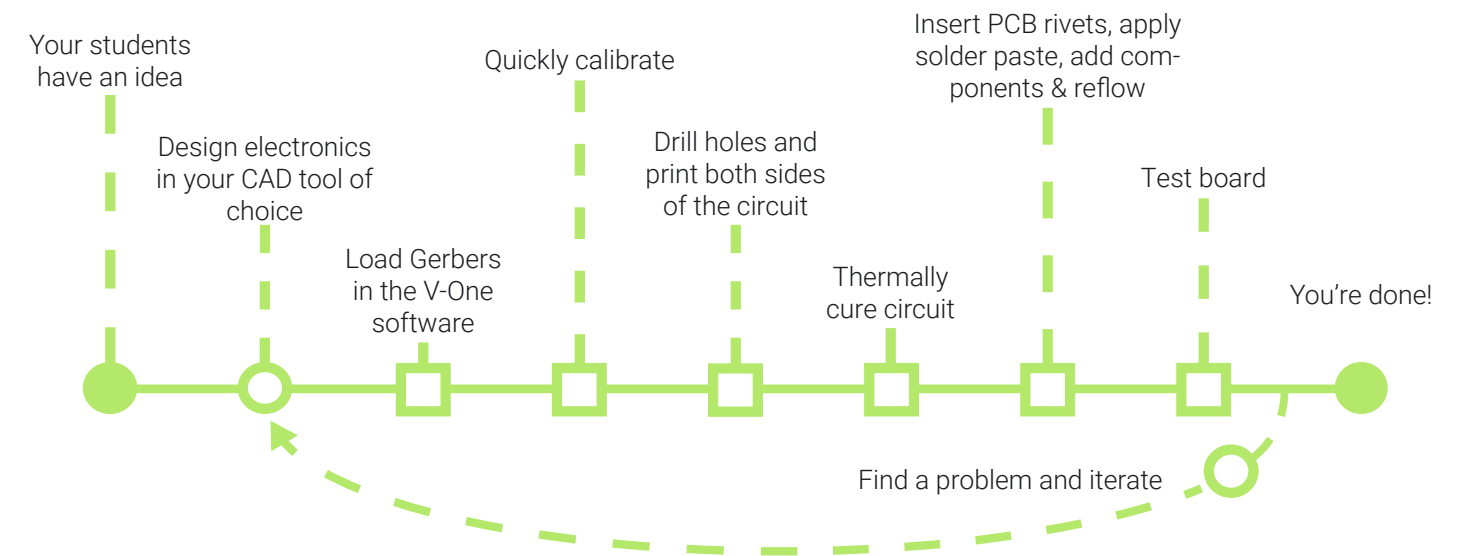




A co-op student using the V-One at the studio of Dr. Philip Beasley, an architect and professor at the University of Waterloo who uses the V-One to print lightweight circuit boards for structures that move and respond to stimuli like living systems.

# Teaching Electronics Design with the Voltera V-One

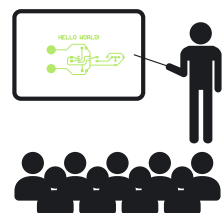


## A New Standard in Electronics Education

At Voltera, we believe that the best way to learn how a circuit works is to build one.

There's a difference between understanding what a capacitor is and seeing what it does. A theoretical foundation is important, and the current education system is good at making sure every student has one. Unfortunately, prototyping custom circuits from scratch has been too expensive and time consuming for use in the classroom. Until now.

Students need a tool that lets them complete electronics projects in under an hour in a way that is hands-on, simple to understand, and that sparks a lifelong love for technology. The reward for solving these problems will be a generation of students enthusiastic about bringing their school projects home, and parents who marvel at their children's technological creations.



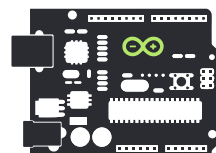
### All-in-one circuit design

Print conductive traces, drill through-holes, dispense solder paste and reflow components on your desktop. The V-One is a PCB factory the size of a laptop.



### Easy experience

Using the V-One is a breeze. From simple software with in-app video instructions to magnetic attachments, it's as easy to use as an iPad app.



### Dev Kit Friendly

The Voltera V-One is designed to work with open source platforms like Arduino, Particle and Raspberry Pi. Go from idea to working prototype in one lesson.

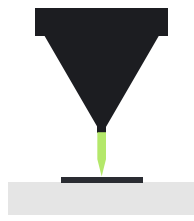
The V-One is used in classrooms around the world to teach the next generation of innovators.



A highschool in Yeongcheon-si, Gyeongsangbuk-do, South Korea where students learn about the fundamentals of electronics design by creating their own circuit boards from scratch with a Voltera V-One in a lab outfitted with a printer for each student.

# Design. Print. Test. Repeat.

Build, learn and iterate, all before the bell.



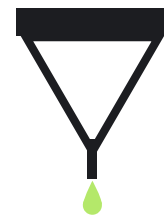
Align

Align quickly using Voltera's smart height probe and existing board features as fiducials for XY alignment.



Drill

Designed to be compact, the V-One drills through-holes and vias at 13,000 RPM with a 3 mil runout.



Dispense

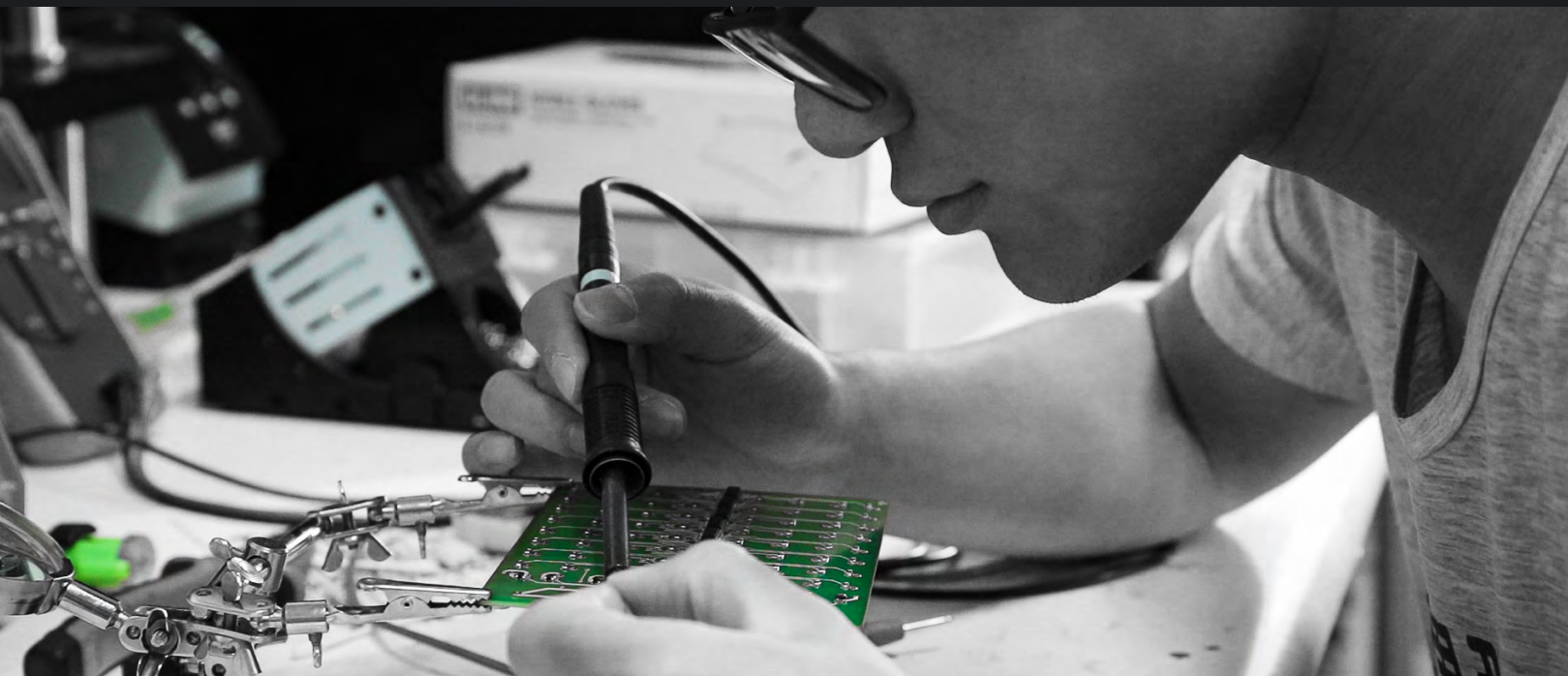
Deposit ink and solder paste on printed or factory-fabbed boards with a 0.65mm pin-to-pin pitch.



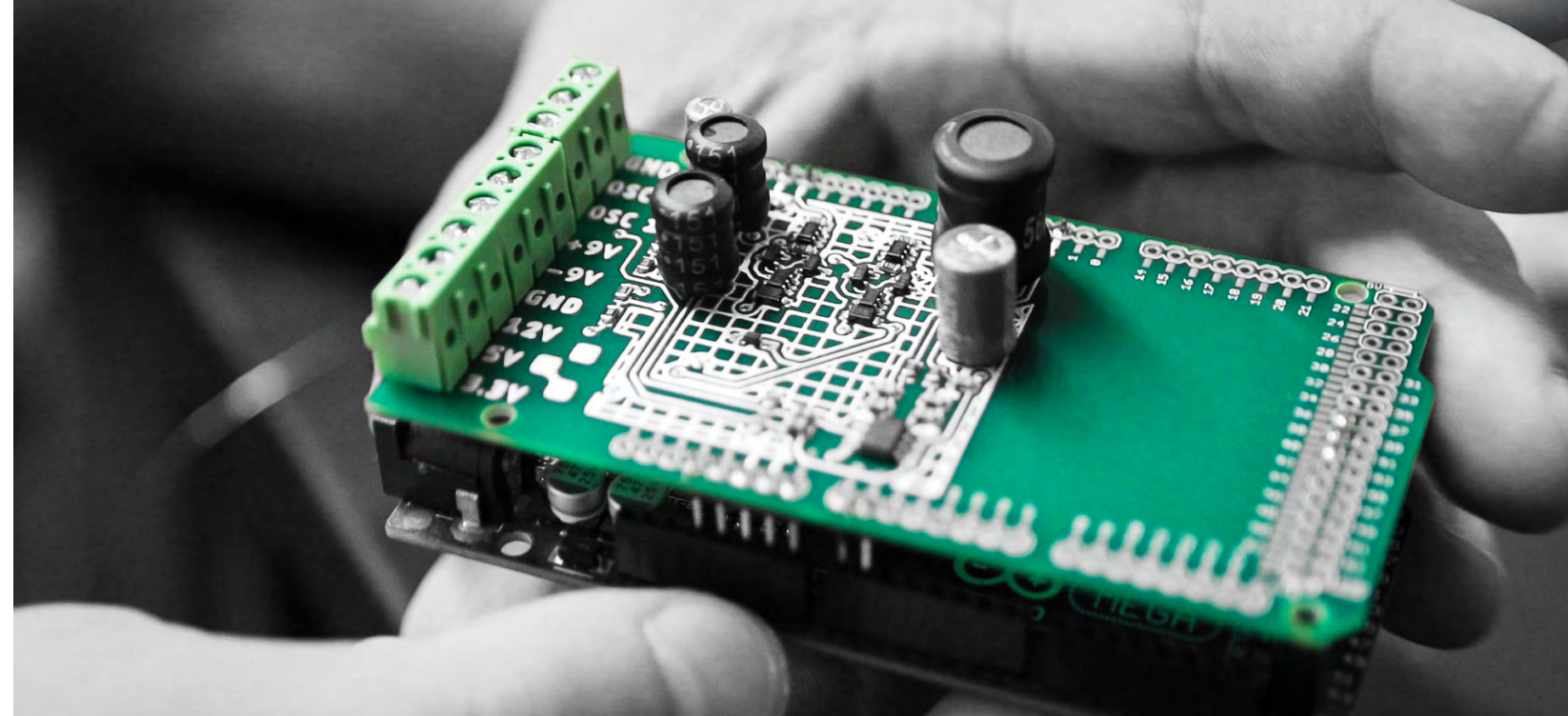
Reflow

Cure ink and reflow with one click using pre-registered heating profiles on the 550W heater.

Research teams and maker labs at institutions like Princeton, Stanford, Harvard and Oxford, as well as highschools around the world, use the V-One to rapidly design hardware.



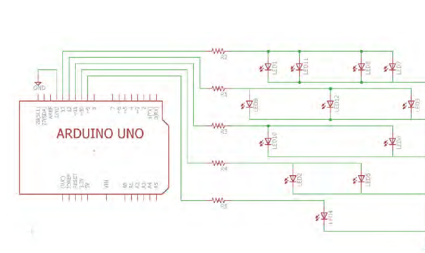
Co-op student Sherman Qui hand soldering through-hole components to a board printed on the Voltera V-One.



An Arduino Mega shield with custom printed traces, populated and reflowed on the Voltera V-One.

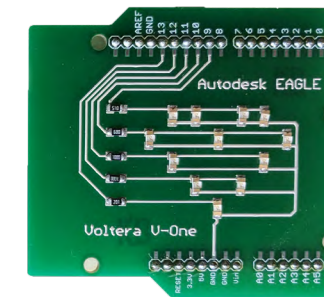
## Template shields for Arduino, Raspberry Pi and more.

Give your students the hands-on experience they'll need in industry.



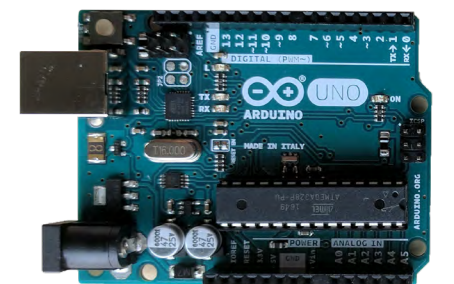
Design

Design your schematic and layout in Eagle, Altium, KiCad, or any other design software with Gerber output. Then, load your design to the V-One software and you're ready to print.



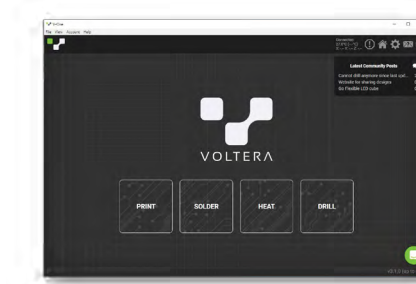
Print & populate

Print and cure your circuit design on template boards specifically designed by Voltera to work with open source microcontrollers. Then dispense solder paste, populate & reflow.

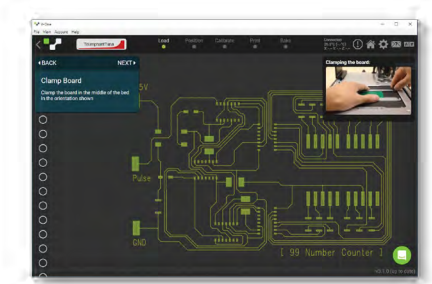


Watch it work

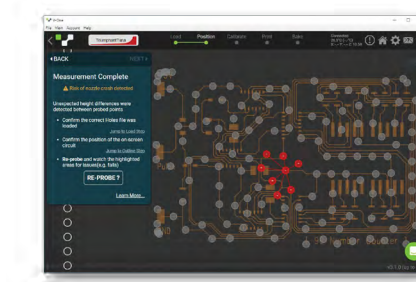
Once the circuit is finished, mount it onto the Arduino and program your prototype. All in all, the above project took less than 2.5 hours from start to finished, functioning device.



Simple and elegant design.



Step-by-step video instructions.



Smart alerts prevent printing issues.



In-app support chat.

## Software that teaches every step of the way

Lab software that's as easy and intuitive as a smartphone app

Sick of making your students use software that was created in the days of dial-up internet and beepers? They are too.

Our software is simple and straightforward, with instructional videos to guide you every step of the way. Support chat is built right into the app, and a playlist of detailed

support videos will make sure you never get stuck. Our software is also completely free: no recurring licenses or big up-front payments required.

Your students can get started with learning electronics moments after your IT team installs the software from our website.



Easy

The V-One was designed to be used by everyone. Even with no experience, you can sit down and print your first circuit in minutes.



Intuitive

Our software is part of what makes the V-One so intuitive. Follow our workflow and you'll go from a blank board to a finished circuit in under an hour.



Free

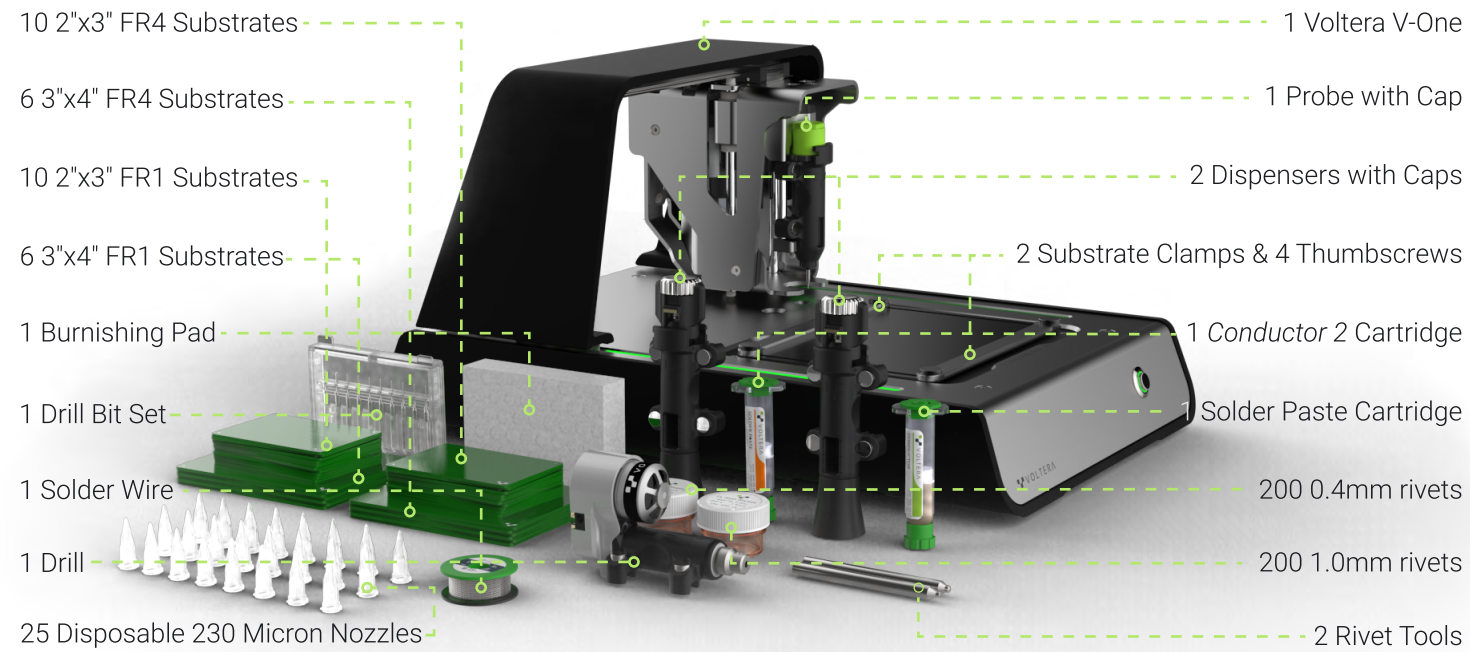
Our goal is to help the world build hardware faster, and completely free software is a part of that. No upfront costs or recurring license fees required.

Whether you are teaching at a high school, college, or graduate level, the simplicity of the V-One platform makes it easy to learn and to use.

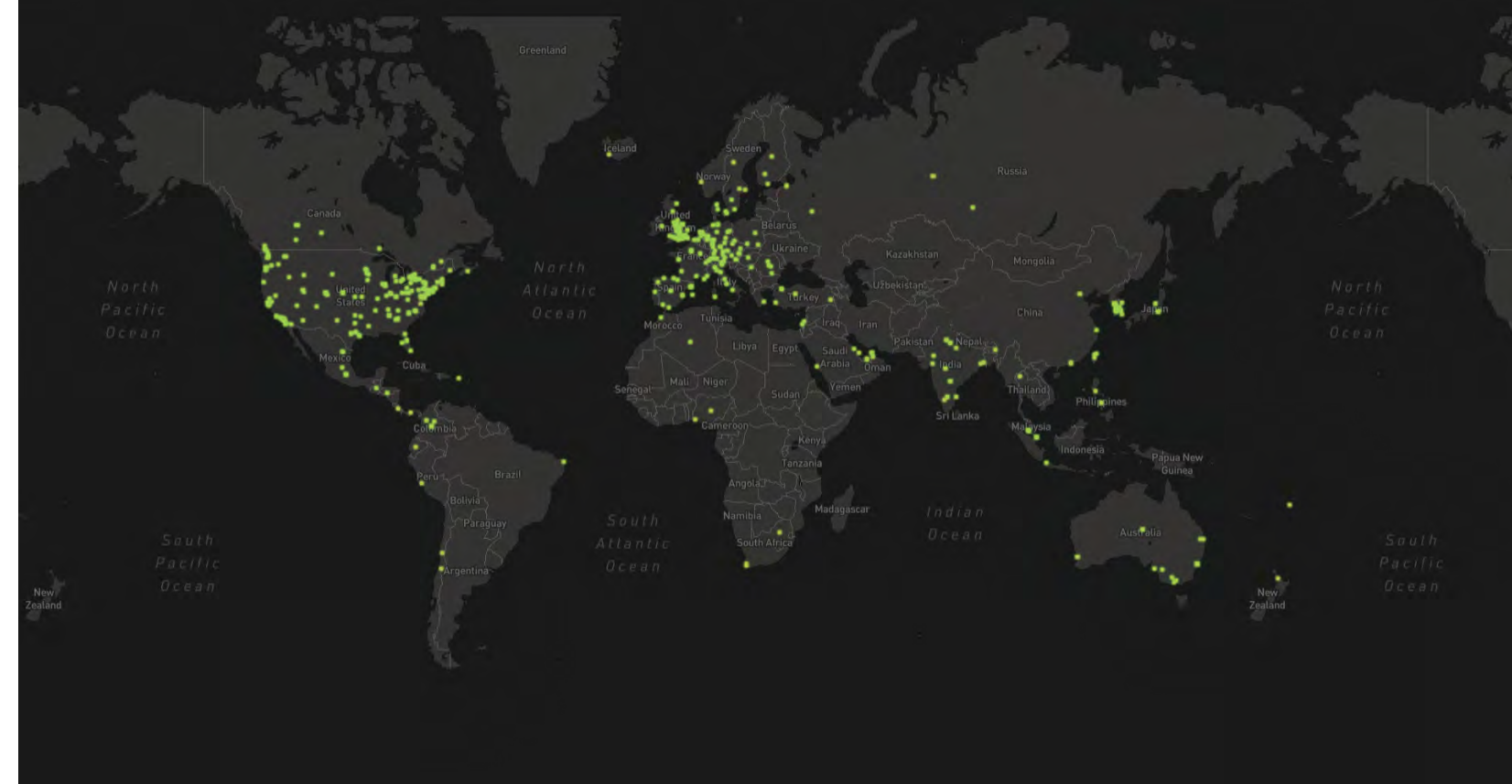


Shannon Prindle, an Aerospace Engineering student at Princeton University, who who fabricated a circuit on the Voltera V-One that will be launched into space on a cube satellite.

# What's in the box?



(Not pictured) 1 Sacrificial Layer 1 Hello World Starter Kit 1 Punk Console Starter Kit 1 Voltera Anti-Static Tweezers 1 Set of Safety Glasses



## A global community of users.

Join the researchers, educators and engineers around the world innovating with the V-One.

We have shipped thousands V-Ones to over 60 countries and counting with more than a dozen resellers globally.

Academic reserachers creating exotic printed electronics, product developers at the world's top tech companies and instructors helping students learn the fundamentals of electronics design are using the V-One:

*"I'm setting up our small spacecraft design lab with a strong focus on enabling our students to make every piece*

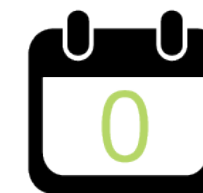
*of the spacecraft in-house here, because a trap that a lot of these cube-sat projects fall into is that they end up having to buy a lot of the subsystems or hardware from outside vendors. I think it's not as rewarding, I don't think it's as pedagogically valuable, and it robs students the opportunity to learn the nuts and bolts of how every subsystem works."*

—Dr. Michael Galvin, Senior Technical Support Staff  
Department of Mechanical & Aerospace Engineering  
Princeton University



Save money

Save time and money on shipping fees and board spins while gaining the pedagogical advantage of printing circuits in the classroom.



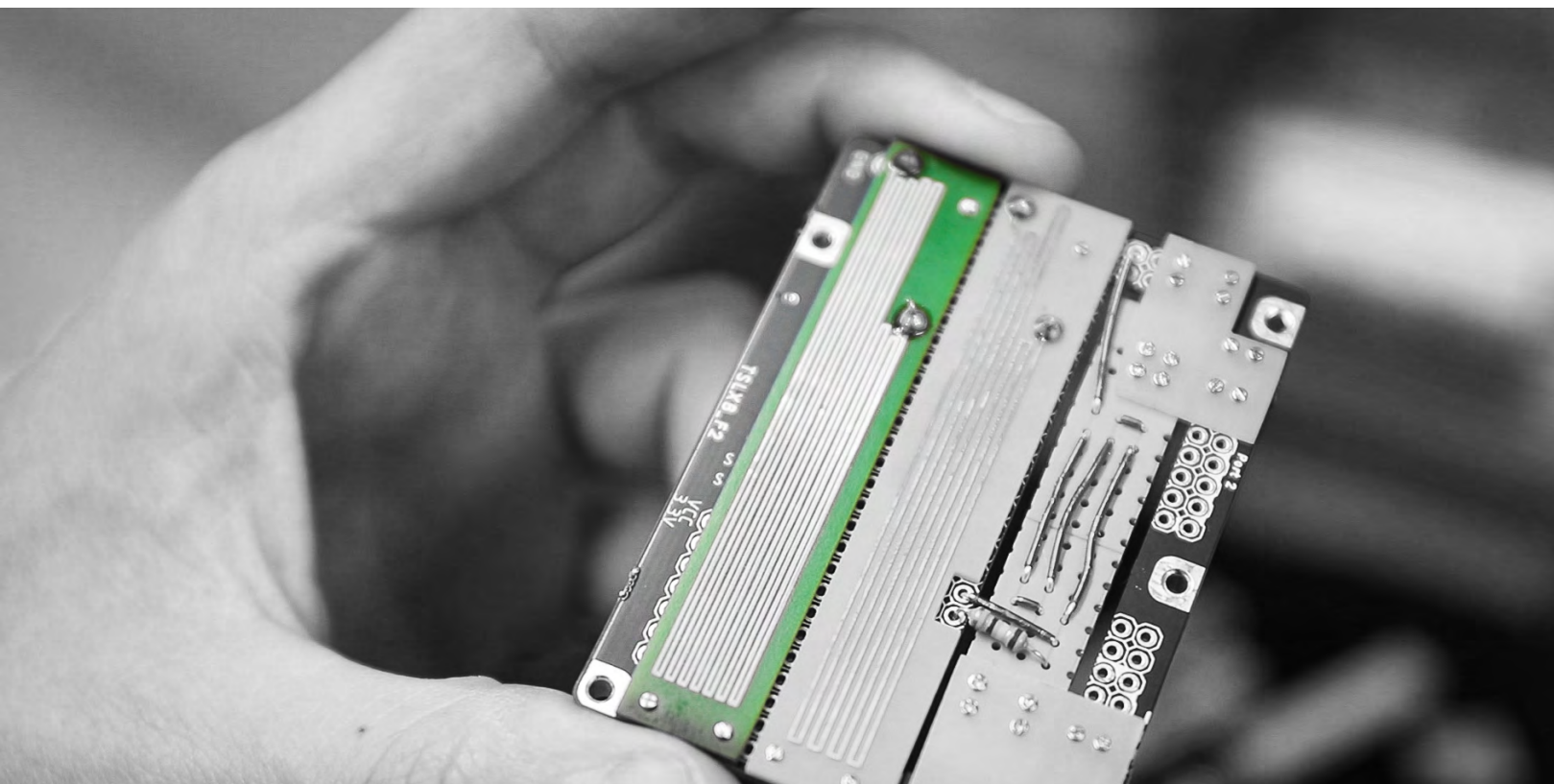
o-day lead time

The V-One works for short attention spans. Your students can watch their circuit come to life in an hour and test their prototype board as homework.



Online help center

Searchable guides, safety data sheets, getting started projects, video tutorials & educational content. All with technical support staff a message away.



The circuit designed by Shannon Prindle at Princeton, part of the payload for a cube satellite scheduled for launch. The circuit is designed in part to test the performance of conductive ink in low Earth orbit for aerospace applications.



# The V-One Spec

PRINTING	METRIC	IMPERIAL
Minimum Trace Width	0.2mm	8mil
Minimum Passive Size	1005	0402
Minimum Pin-to-Pin Pitch	0.65mm	26mil
Resistivity	12mΩ/Sq @ 70um Height	12mΩ/Sq @ 3mil Height
Supplied Substrate Material	FR4	FR4
Maximum Board Thickness	3mm	0.125"

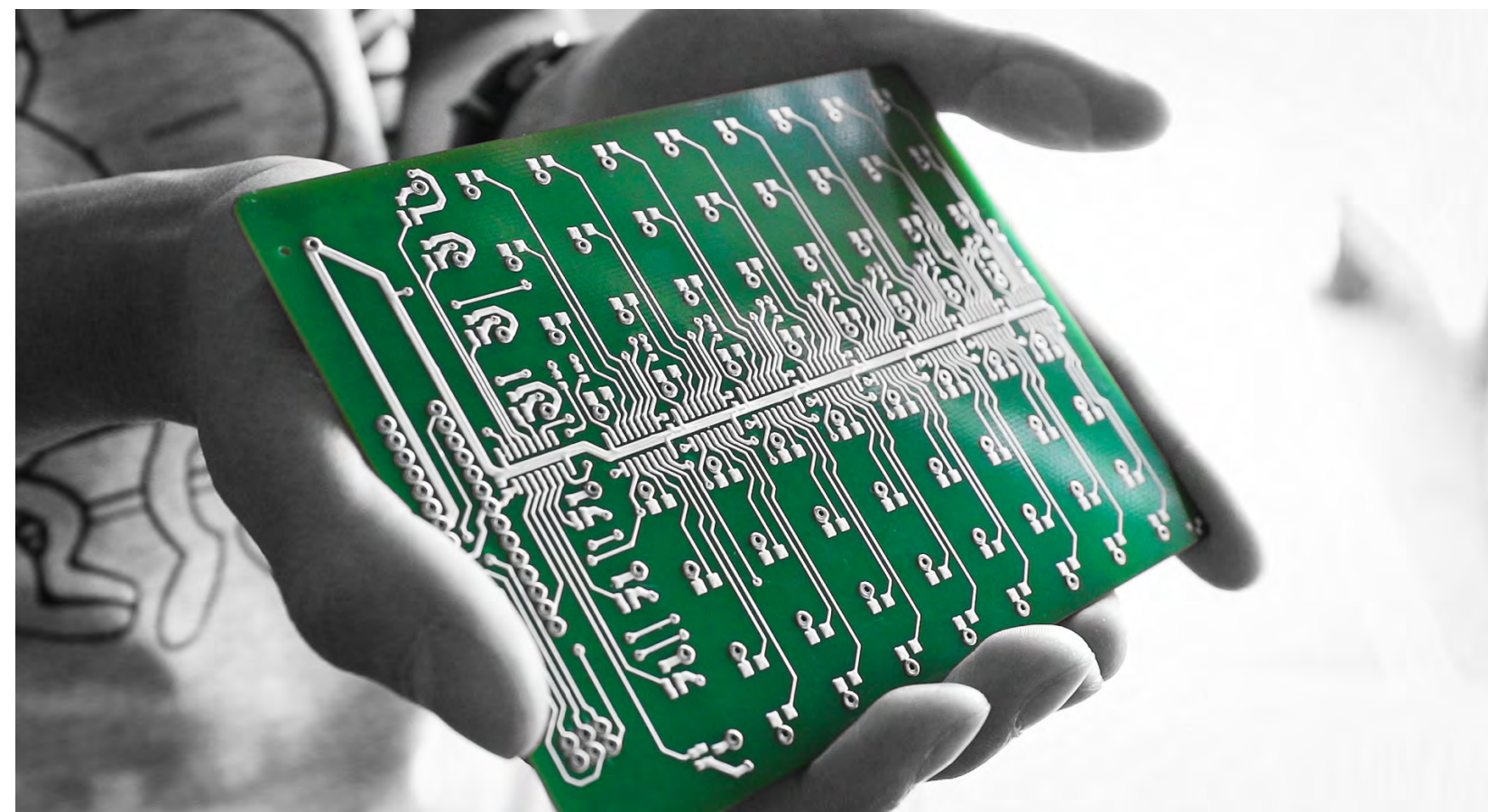
SOLDERING	METRIC	IMPERIAL
Minimum Passive Size	1005	0402
Minimum Pin-to-Pin Pitch	0.5mm	20mil
Solder Paste Alloy	Sn42/Bi57.6/Ag0.4	Sn42/Bi57.6/Ag0.4
Solder Wire Alloy	SnBiAg1	SnBiAg1
Soldering Iron Temperature	180-200°C	355-390°F

FOOTPRINT AND PRINT BED	METRIC	IMPERIAL
Dimensions (L x W x H)	390mm x 257mm x 207mm	15.4" x 10.1" x 8.2"
Weight	7kg	15.4lbs
Print Area	128mm x 116mm	5" x 4.5"
Max. Heated Bed Temperature	240°C	464°F

DRILLING	METRIC	IMPERIAL
Spindle Speed (Max.)	13,000 RPM	13,000 RPM
Power	12V, 25W	12V, 25W
Runout (TIR)	0.076mm	0.003"
Shank Diameter	3.175mm	1/8"
Supplied Substrate Material	FR1	FR1
Bit Diameter (Max.)	2mm	0.078"
Bit Length (Max.)	38.1mm	1.5"

SOLDER COMPATIBILITY	Sn42/Bi57.6/Ag0.4 Solder	Sn63/Pb37 Solder
Standard Ink	✓	X
Flexible Ink	✓	X
Copper PCBs	✓	✓
HASL PCBs	X	✓

SOFTWARE REQUIREMENTS	Operating Systems	Compatible File Format	Connection Type
Operating Systems	Windows 7, 8, 10 (64bit), OSX 10.11+	Gerber	Wired USB 2.0
Compatible File Format		Gerber	
Connection Type			Wired USB 2.0



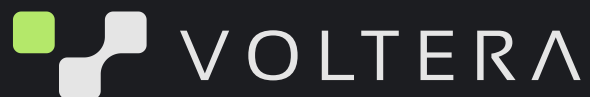


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