

The best of fuel cell technology for your projects and research



- FUEL CELL PRINCIPLES
- RENEWABLE ENERGY
- HYDROGEN HYBRID APPLICATIONS

Hydrogen on demand for universities and schools



HYDROFILL PRO

FCH-020

- Produces hydrogen safely
- Indispensable for HYDROSTIK based engineering projects
- Input is just water and electricity

FEATURES

HYDROSTIK PRO

LWH22-10L-5

- Stores hydrogen safely in a non-compressed, solid metallic form
- Powers Horizon fuel cells up to 30W
- Refillable multiple times

FEATURES

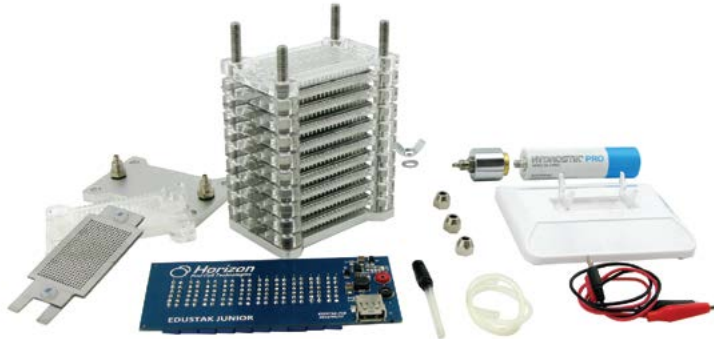


The world's only on demand hydrogen supply system for refilling HYDROSTIK PRO metal hydride cartridges. By generating hydrogen through water electrolysis, HYDROFILL PRO enables homes and classrooms to become energy self-sufficient. Then, rather than compressing hydrogen gas, the safe and reliable HYDROSTIK PRO binds hydrogen with a metal alloy to form a solid metal hydride. Perfect for next generation science kits and engineering projects.

FCH-020 HYDROFILL PRO	Stack type	PEM electrolysis cell
	Dimensions (WxDxH)	145x153x208 mm (5.7x 6x8.2 in)
	Weight	1.8Kg ±5% (3.97Lbs ±5%)
	Rated power	≤23W
	Input voltage	DC: 10V-19V
	Water input	De-ionized or distilled water
	Water temperature	10-40°C (50-104°F)
	Water consumption	Approx. 20ml/hr (1.2in ³ /hr)
	H₂ output pressure	0-3.0 MPaG (0-435.11 PSI)
	H₂ generation capacity	Up to 3L/hr (0-183 in ³ /hr)
	Purity	99.995%
	Compatible cartridge	HYDROSTIK & HYDROSTIK PRO
	Refilling time for one	Around 4 hours
	Cartridge	(at 25°C room temperature)

LWH22-10L-5 HYDROSTIK PRO	Name	HYDROSTIK PRO
	Model number	LWH22-10L-5
	Capacity	10L hydrogen
	Hydrogen purity	≥99.995%
	Cartridge size	ø22x88mm
	Weight	Approx. 105g
	Storage material	AB5 metal hydride
	Rated charging pressure	3.0MPa
	Working temperature	0-55°C (0-131°F)
	Service life	10 years

Fuel cell engineering starts now



EDUSTAK JUNIOR

FCSU-32

Fuel stack technology for the classroom without using compressed hydrogen. Investigate the power potential of hydrogen technology by constructing your own 4W fuel cell stack—that's 6V at 0.7A produced at a flow rate of 0.05L per minute. HYDROSTIK PRO metal hydride cartridges provide instant 99.995% pure hydrogen fuel and no tools are required to make the stacks. Create your own hydrogen powered devices that can be completely self-sufficient with the optional addition of the HYDROFILL PRO (FCH-020) hydrogen station.

Build It Yourself Fuel Cell Stack



EDUSTAK PRO

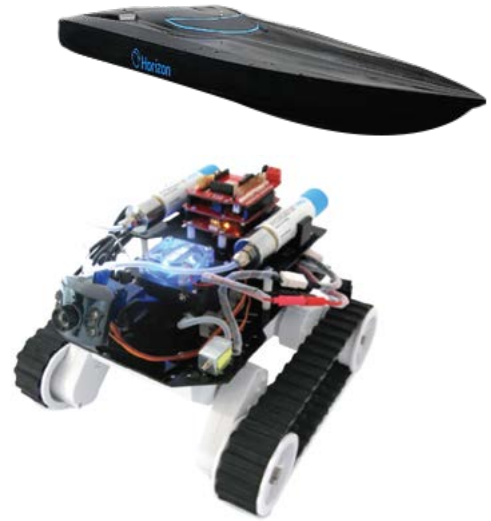
FCSU-33

Discover the fuel stack technology that is powering cutting-edge transport solutions and generators. Assemble your own 20W fuel cell stack of individually connected cells and then power up with the refillable HYDROSTIK PRO metal hydride cartridges producing 99.995% pure hydrogen. The cells don't need any tools to assemble into stacks so you can concentrate on optimizing the efficiency to generate 6V at 2.4A produced at flow rate of 0.25L per minute. For a truly self-contained energy system add the HYDROFILL PRO (FCH-020) on-demand hydrogen supply.

	FCSU-32 EDUSTAK JUNIOR	FCSU-33 EDUSTAK PRO
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Type of fuel cell	PEM	PEM
Number of cells	10	10
Rated power	4W	20W
Performance	6V at 0.7A	6V at 3.4A
Reactants	hydrogen and air	hydrogen and air
External temperature	5 to 35°C	5 to 40°C
Max stack temperature	55°C	60°C
H ₂ pressure	0.45-0.55bar	0.45-0.55bar
Hydrogen purity	≥99.995% dry H ₂	≥99.995% dry H ₂
Humidification	self-humidified	self-humidified
Cooling	air (integ. cooling fan)	air (integ. cooling fan)
Dimension	125 X 60 X 95mm	105 X 90 X 130mm
Weight	510 g	1000 g
Flow rate at max output ¹⁾	0.05 L/min	0.25 L/min
Start up time	≤30s at room temp.	≤30s at room temp.
Efficiency of stack	40% at full power	40% at full power
Low voltage shut down	5V	5V
Over current shut down	1A	10A
Over temp. shut down	50°C	60°C

Create your own hybrid hydrogen-electric applications

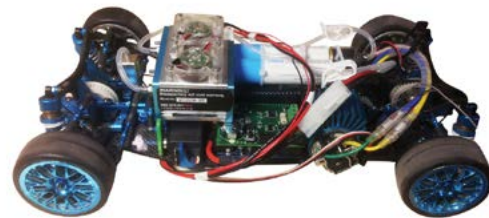
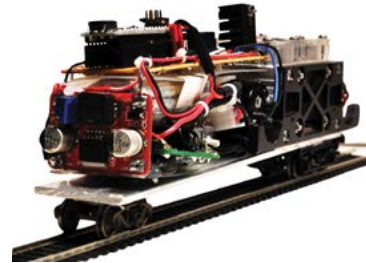
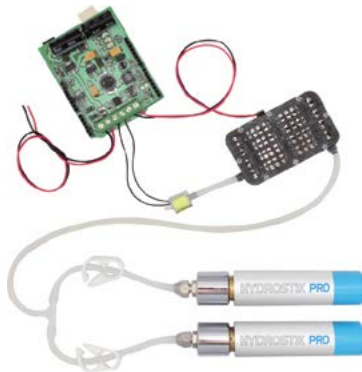


H-CELL 2.0

FCJ-21

Create your own hybrid hydrogen-electric applications. Horizon's next generation H-Cell replicates the technology of real-scale hybrid vehicles—improving electrical batteries with the addition of hydrogen fuel that has extremely high energy density. Acceleration is still drawn from the existing batteries while the H-Cell provides hydrogen power for cruising. With H-Cell the vehicle can run up to four times longer than with the battery alone. The system is optimized for 1:10 scale vehicles and designed to create a hybrid system capable of 30W of power.

Open source fuel cell applications



FUEL CELL DEVELOPER KIT

FCDK-1.5 / FCDK-12 / FCDK-30

Join the FCDK community and start experimenting with an open-source fuel cell system that enables hobbyists, engineers and aspiring inventors to create their own hydrogen powered devices. Hobbyists have created all manner of hydrogen-powered vehicles with FCDK — from RC boats, trains and cars to lighting systems, autonomous robots and more. Plus, the thriving inventor forum is always there to offer support and encouragement to experienced pros and newbie enthusiast alike. Available in 1.5, 12 and 30W versions, FCDK provides everything the amateur engineer could need: HYDROSTIK PRO metal hydride storage cartridges, micro fuel cell technology, pressure regulators, electrical cables, tubing and clips to regulate hydrogen supply, and an electronic controller to manage output voltage for integration with one of Arduino, Raspberry Pi or mbed development boards.

Understand energy like never before

- Hydrogen energy experiments
- Wind energy experiments
- Bio-energy experiments
- Thermal energy experiment
- Mechanical / electrical energy experiments
- Salt water energy experiments
- Multi energy powered car experiments

EXPERIMENTS



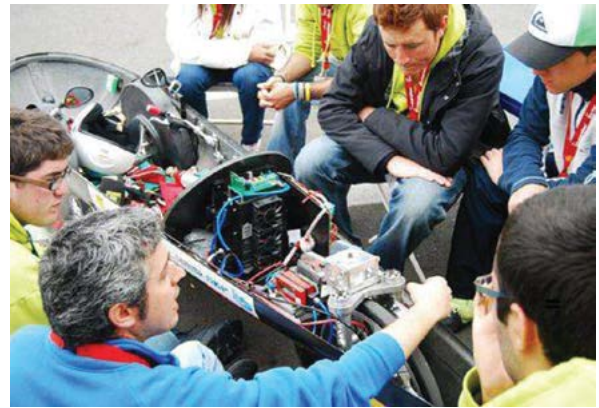
HORIZON ENERGY BOX

FCJJ-40

The best choice for a complete understanding of how fuel cell technology interacts with renewable energy sources to create an entirely sustainable power grid. Harness the power of the sun, convert wind energy into electrical power, generate energy with a simple hand crank and see first-hand the incredible storage potential of a super capacitor. Compare the fuel cells to find the best energy solutions – will it be the PEM hydrogen fuel cell, the salt water fuel cell or the direct ethanol fuel cell? Set up experiments to see how different alternative technologies interact with each other, play with the angle of wind turbine blades, record the effect of partial shade on the solar panel and build your own micro grid. Countless experiments, so many scientific principles at work and plenty of space for creativity.

Shell Eco Marathon

The Shell Eco Marathon is an international student competition to create the most efficient alternative energy vehicles. Every year, teams from North and South America, Europe and Asia go head to head to create racecars that use the least amount of energy and travel the farthest. Education, innovation and competition in one fantastic event! Horizon is happy to help and supplies teams with the some of the most efficient fuel cell stacks on the market.



Hydrogen Energy Challenge

The Hydrogen Energy Challenge is a new interactive competition for secondary schools in London. Arcola Energy's science and Technology workshops, run by a team of expert practitioners, explore Renewable energies (Hydrogen and Fuel Cells) and the possibilities that they offer for a low carbon future. They offer a wide range of opportunities, or pupils to learn in a creative environment. Arcola Energy has delivered similar workshops to over 4,500 pupils to date.

Horizon Teacher Training

Along with our dedicated partners, Horizon works towards developing and implementing a program to promote education related to renewable energy sources and energy efficiency in 15 schools across Poland. In addition to lab equipment and software, Horizon provide technical material to help educators create teaching materials and a school accreditation program for renewable energy and energy efficiency.



St Jo 24h Race

24h de St Jo takes its inspiration from 24 Heures du Mans, the oldest car race on earth-- but instead of gas-guzzling race cars, St Jo is a 1:10 scale RC car construction and racing challenge, designed to test the skills of mechanical engineering students and pit high schools against each other in friendly competition and mutual discovery. To make the project even more interesting, rather than running off a traditional lithium battery the cars utilize Horizon's H-Cell 2.0 fuel cell system and hybrid integration technology.

A few more Horizon power solutions...

FCH-010

HYDROFILL & HYDROSTIK
Safe, portable hydrogen & on demand refills

World's only consumer grade desktop electrolyzer, automatically refills HYDROSTIK metal hydrides.

FCHP-02

MINIPAK
Handheld USB charger

2W portable hydrogen power for handheld electronics.

HYM12(24)-150

HYMERA
Efficient, long duration power

150W fuel cell power supply compatible with 7.5kWh LINDE GENIE industrial bottles, ideal for construction, security, marine and hybrid solar industrial power supplies.

HYD12(24)-180

HYDROMAX 150
Battery charge maintainer

150W fuel cell battery charge level maintainer using a unique non-flammable fuel, ideal for RV/camping and off-grid industrial solutions.

Portable Power

H-SERIES 10W-5kW PEM STACKS
Simple, reliable, compact, easy to integrate

We offer the widest range of standard PEM fuel cell systems today which feature some of the highest power densities available in the world.

FCS-B12	H-12 PEM FUEL CELL 12W	FCS-B20	H-20 PEM FUEL CELL 20W	FCS-B30	H-30 PEM FUEL CELL 30W	FCS-C100	H-100 PEM FUEL CELL 100W	FCS-C200	H-200 PEM FUEL CELL 200W	FCS-C300	H-300 PEM FUEL CELL 300W	FCS-C500	H-500 PEM FUEL CELL 500W
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Fuel Cell Stacks

FCS-C1000	H-1000 PEM FUEL CELL 1kW	FCS-C2000	H-2000 PEM FUEL CELL 2kW	FCS-C3000	H-3000 PEM FUEL CELL 3kW	FCS-C5000	H-5000 PEM FUEL CELL 5kW
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XP-SERIES STACKS
The most efficient fuel cells on the market

Lighter and more compact versions of the H-series, designed for efficiency, a regular winner in Shell Ecomarathon competitions.

FCS-500XP	H-500 XP PEM FUEL CELL 500W	FCS-1000XP	H-1000 XP PEM FUEL CELL 1000W
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Fuel Cell Stacks

AEROSTAKS 200W-1000W
World's lightest, highest power density stacks

Up to 8 times lighter and smaller than our H-SERIES fuel cells, Aerostaks are used in specialty applications where weight is a critical factor.

AST01-01	A-200 PEM FUEL CELL 200W	AST02-01	A-500 PEM FUEL CELL 500W	AST03-01	A-1000 PEM FUEL CELL 1000W
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STANDARD AEROPAK SYSTEM 200W CONTINUOUS
High performance fuel cell

AEROPAK is an ultra-light power system enabled by fuel cells and an integrated hydrogen-on-demand system and chemical fuel tank.

Ultra-Light

ECMR-1000 (5000)

ECOBX RMFC SERIES (1KW - 5KW)
Reformer integrated fuel cell UPS solutions

Remotely accessible clean energy generation with optional extended run fuel tank cabinets. Ideal for telecoms, remote monitoring and surveillance systems.

GHUB-500(2000)

GREENHUB POWERBOX
Fuel cell UPS 500W-2kW

500W-2kW suite of standby power systems running on industrial hydrogen gas or metal hydride storage.

APAK-3000

AUTOPAK AUTOMOTIVE FUEL CELL SYSTEM
Fuel cell integration for hybrid vehicles

A turnkey automotive power system solution using next generation PEM fuel cells - enabling low-cost hydrogen vehicles.

Industrial Solutions