

product  
catalog

PARALLAX<sup>®</sup>  
[www.parallax.com](http://www.parallax.com)  
EQUIP YOUR GENIUS



**Parallax Inc.**  
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## INTERNET

- Main - <http://www.parallax.com>
- Learn - <http://learn.parallax.com>
- Forums - <http://forums.parallax.com>
- Propeller Object Exchange -  
<http://obex.parallax.com>

## E-MAIL

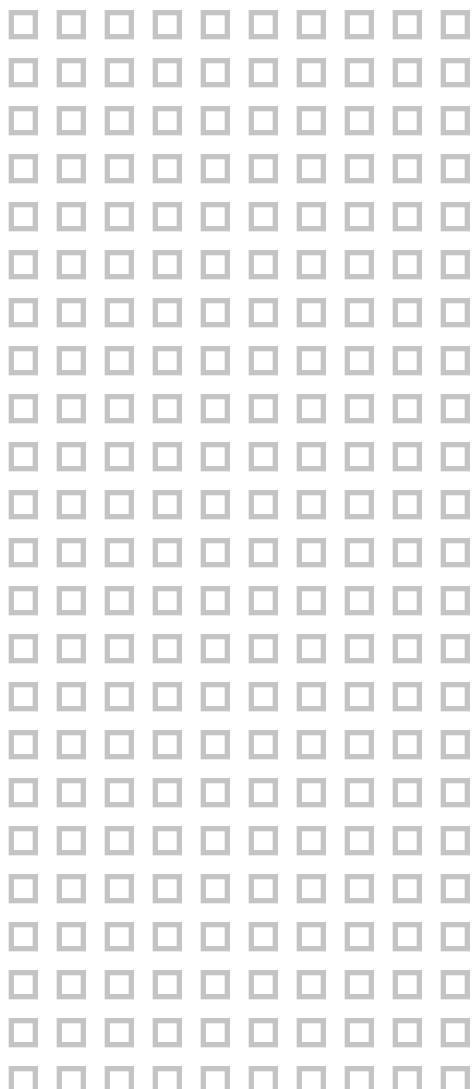
- [support@parallax.com](mailto:support@parallax.com)
- [sales@parallax.com](mailto:sales@parallax.com)
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**Special thanks to:** Courtney Jacobs, David Carrier, Emily Kurze, Forrest Bourke, Jessica Uelmen, Kristina Stewart, Lauren Davis, and Stephanie Lindsay.

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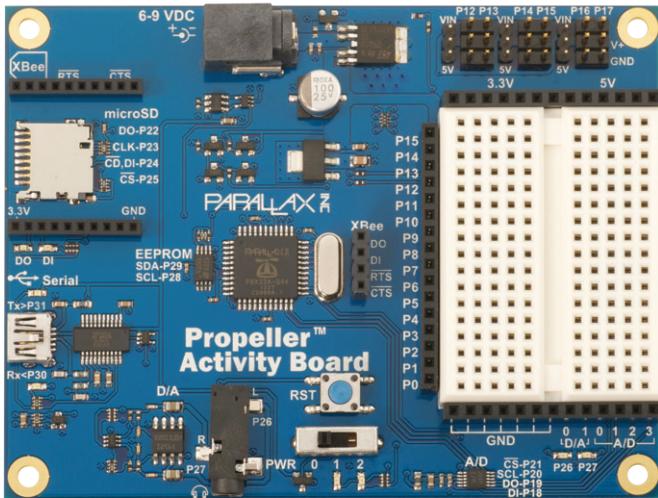
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**Note:** Since our catalogs are referred to by our customers for many months, we reserve the right to change prices without notice. Prices may vary between our ads and our catalogs. Product description, typographic, pricing, and photographic errors are unintentional and subject to change.

# Propeller Multicore Microcontroller

The Propeller chip, which features eight 32-bit processors with a shared system clock and memory, makes true independent and simultaneous multi-processing possible. The Propeller chip may be programmed in our object-based Spin language, low-level Assembly, or C/C++. Users appreciate the overall processing power, I/O capabilities and parallel processing capabilities. For more information on commercial integration of the Propeller Chip see page 07.

**NEW!** Propeller Activity Board #32910; \$49.99 Program in C with the Propeller Activity Board and the new Propeller C Learning System. Harnessing the power of the 8-core Propeller microcontroller is now easier than ever before. The built-in Propeller P8X32A programming system is pre-wired with the most popular peripherals, making experimenting fast and fun.



## Key Features:

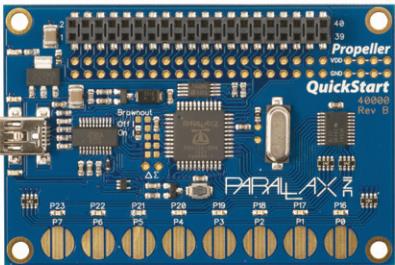
- XBee socket
- microSD card holder
- Mini audio/stereo jack
- Six 3-pin headers
- Breadboard
- A/D and D/A converters
- Power via USB or power supply/battery pack

New  
ActivityBot  
on page  
08!

Our Propeller C Learning System of tutorials, example code, development boards, and software make it easy to learn multicore programming in C.

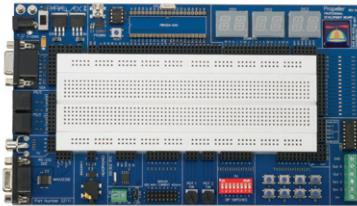
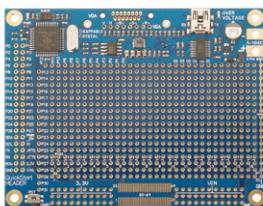
- **Easy Circuit Building** The Propeller Activity Board is the primary platform for the new Propeller C tutorials. Solder-free prototyping board and sockets for peripherals make it quick to build fun projects.
- **SimpleIDE Software** This free, open-source programming software works with our Propeller C tutorials.
- **Simple Libraries** These pre-written code libraries make it quick to add a variety of devices to your project — just click the 'Add Simple Library' button. Explore the Simple Library Index, available from the SimpleIDE Help menu. Each library has documentation you can browse.

Find QuickStart accessory boards online and on pages 22 and 27.



## P8X32A QuickStart Board #40000; \$29.99

This open-source reference design provides basic Propeller circuitry. The QuickStart is fully expandable and provides unimpeded access to all I/O pins through an expansion header and includes button inputs and LEDs to demonstrate programming. A great evaluation platform for developing your commercial Propeller microcontroller application.



**Propeller Project Board USB #32810; \$24.99** For dedicated projects. Soldering required.

**Propeller Board Of Education #32900; \$129.00** Loaded with peripherals and project possibilities.

**Propeller Mini #32150; \$24.99** Complete prototyping system with a small footprint.

**Propeller Professional Development Board #32111; \$149.99** Ample breadboard space and peripheral connectors provide a playground for electronics projects. 40-pin P8X32A DIP chip included.

---

## Propeller Education Kit (40-Pin DIP Version) #32305; \$99.99

This kit features breadboard-friendly versions of the Propeller chip, EEPROM and other core components making it easy and inexpensive for students to experiment while being able to replace parts as needed. *Propeller Education Kit Labs: Fundamentals* book is a comprehensive series of labs covering Setup and Testing, I/O and Timing, Methods and Cogs, Objects, and Counter Modules and Circuit Applications.

*This kit is designed for those with previous microcontroller programming and electronics experience.*



# THE ORIGINAL BASIC Stamp

A BASIC Stamp module is a single-board computer that runs the Parallax PBASIC language. The developer's code is stored in EEPROM, which can also be used for data storage. The PBASIC language has easy-to-use commands for basic I/O, like turning devices on or off, interfacing with sensors, etc. More advanced commands let the BASIC Stamp interface with other integrated circuits, communicate with each other, and operate in networks. The BASIC Stamp is available in module or interpreter chip format.

**Why should you use the BASIC Stamp?** For those new to electronics, the PBASIC language is very powerful yet very easy to learn. BASIC Stamp programming is the perfect entry to technology literacy. Parallax offers a wealth of free support, tutorials, and resources for learning how to program and design projects with the BASIC Stamp.

**Where is the BASIC Stamp used?** The BASIC Stamp is used in technology education and as an easy-to-program, quick-to-implement solution in many industries. Hobbyists and engineers alike are finding new uses for this powerful microcontroller every day.

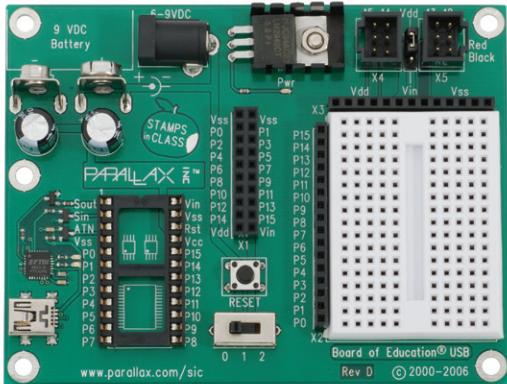
## When might you choose to use the BASIC Stamp?

The BASIC Stamp is a good choice when a well-documented module with plenty of free educational tutorials is required. Persons looking to learn programming, sensor control, home automation, and robotics will find the BASIC Stamp to be the perfect tool. Experienced programmers also enjoy its simplicity for quick projects.

BASIC Stamp modules (shown left to right):

- **BASIC Stamp 1** (not pictured) #BS1-IC; \$29.00
- **BASIC Stamp 2** #BS2-IC; \$49.00
- **BASIC Stamp 2sx** #BS2SX-IC; \$59.00
- **BASIC Stamp 2e** #BS2E-IC; \$54.00
- **BASIC Stamp 2p24** #BS2P24; \$79.00
- **BASIC Stamp 2p40** (not pictured) #BS2P40; \$89.00
- **BASIC Stamp 2pe** #BS2PE-IC; \$75.00
- **BASIC Stamp 2px** #BS2PX24; \$79.00



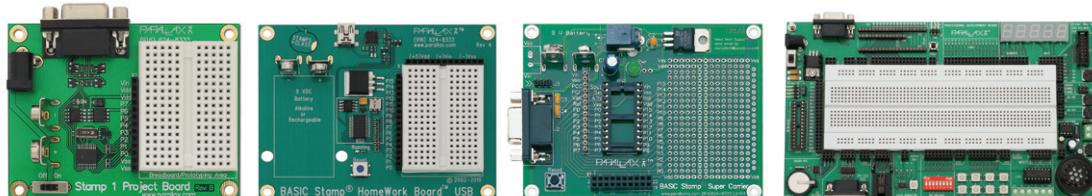


## BASIC Stamp Board Of Education (BOE)

**Serial #28150; \$69.99 and USB #28850; \$69.99**

Originally designed in coordination with our educational customers to teach microcontroller programming. Even if you aren't using our curriculum, the ease of use and expandability make the BOE an ideal project board for BASIC Stamp 2 microcontroller experimentation.

The **Board of Education Full Kit (USB) #28803; \$99.00** contains a Board of Education® carrier board, BASIC Stamp® 2 module, jumper wires, and USB cable to get you started with the hardware basics.



*Left to right: BASIC Stamp 1 Project Board #28150; \$69.99 - BASIC Stamp HomeWork Board (USB) #555-28188; \$39.99 - Super Carrier Board #27130; \$19.99 - Professional Development Board #28138; \$129.99*



### BASIC Stamp Activity Kit (USB) #90005; \$79.00

*No experience necessary.* Learn circuit-building and programming on a BASIC Stamp HomeWork board. Discover how it all works as you go step-by-step through 40 hands-on activities.

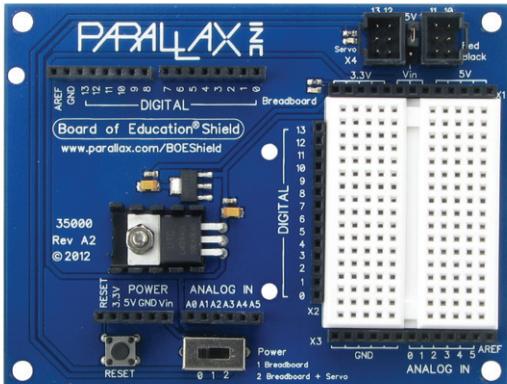


### BASIC Stamp Discovery Kit

**Serial #27207; \$159.99 or USB #27807; \$159.99**

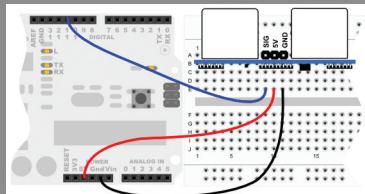
*No experience necessary.* Our most complete kit for learning circuit building and programming includes a BS2-IC module and a Board Of Education.

# Compatible with your Arduino



The **Board of Education Shield** is available alone, or conveniently packaged with the classic Boe-Bot chassis, servos, electronic components, and additional hardware in the **Robotics Shield Kit** (#130-35000; \$129.99 - *more details on page 08*).

**Microcontroller KickStarts** are basic, no-frills coding samples, made so you can get started fast and are available for many sensors and accessories we carry. Each example takes no more than a few minutes to set up and try. KickStarts provide working code and connection diagrams for the Propeller, BASIC Stamp 2, and Arduino Uno.

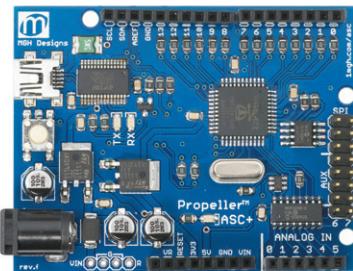


Find them here: <http://learn.parallax.com/KickStart>

## Board Of Education Shield (for Arduino)

**#35000; \$34.99**

Plug the Board of Education Shield into your own Arduino for convenient breadboard prototyping and servo ports, with no soldering required. Arduino programmers who appreciate Parallax's breadboard-friendly sensors and accessories will find them even easier to use with this shield. The Board of Education Shield is designed to be physically compatible with any Arduino Uno or Mega form-factor module. Visit [learn.parallax.com/BOEShield](http://learn.parallax.com/BOEShield) to explore the dozens of tutorials and activities in our online book, *Robotics with the Board of Education Shield for Arduino*.



**Propeller ASC+ #32214; \$49.99**

Use your Arduino shields with this multicore Propeller microcontroller-driven board an program in Spin, Propeller assembly, C or C++.

# WHERE IS THE MULTICORE PROPELLER USED?

The multicore Propeller microcontroller is useful in new designs, including the following applications:



- Motor Control
- Human Interface Devices
- Robotics
- Data Acquisition
- Medical Devices
- Defense and Avionics Applications
- Control Systems

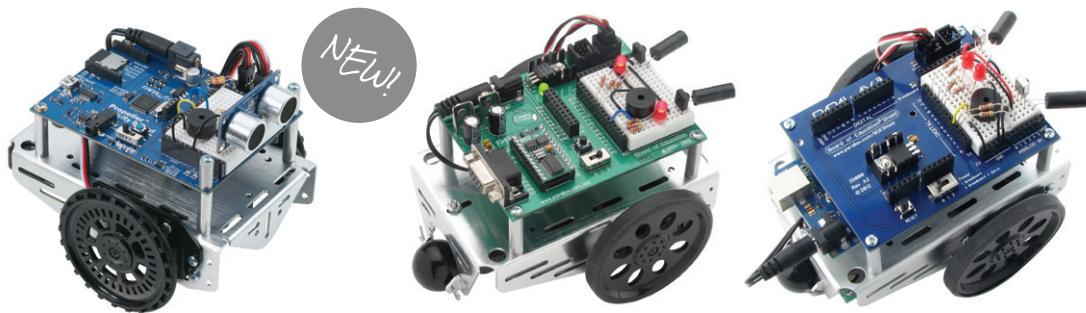
*The Propeller has proven successful in many advanced technological applications. Customers select the Propeller for its flexible multicore design, comprehensive support, and quick time to market.*

FEATURE	BENEFIT
Eight-Core Design	Simplifies program architecture and reduces latency through the allocation of independent I/O tasks to their own core, enabling true concurrent control and eliminating the need for FPGAs in many applications.
Powerful Hardware Peripherals	Each core contains multiple PLLs and flexible counter modules, as well as a high-speed serializer with video capabilities.
Dynamic Software Peripherals	Multicore design allows dynamic reallocation of cores to perform software-defined tasks.
Flexible I/O	Hardware and software peripherals run on any Propeller I/O pin, simplifying PCB routing and allowing revisions in software instead of hardware.
Deterministic Control	Clock-cycle accuracy and repeatability facilitates timing-sensitive applications.
Online Object Library	Code objects available from the Object Exchange at <a href="http://obex.parallax.com">http://obex.parallax.com</a> provide instant functionality and powerful software peripherals for many applications.
Field Application Engineer (FAE) Support	Parallax provides FAE assistance to provide quick answers and design assistance, from concept to manufacturing.
Permissive open-source hardware and software reference designs	A permissive license allows integration of reference designs into production hardware and software without non-disclosure agreements or derivative license hassles. Open-source development tools are available for Windows, OS X, and Linux operating systems
Strong Community	Customers appreciate the community's development assistance, support, and innovative design philosophy.

# ROBOTS

**No previous programming or electronics experience? No problem. Our robotics learning kits will show you how. So are you ready to roll? Parallax has complete robot kits to get you started. Just choose your microcontroller: Propeller, BASIC Stamp, or Arduino. Then simply build and program.**

**Why choose a Parallax robot?** Our development boards have a breadboard to help you learn the hands-on basics of circuit-building. This open platform combined with our wealth of support resources allow for easy expansion with the addition of sensors and accessories.



**Propeller ActivityBot #32500\*** - This zippy robot pairs the classic Boe-Bot chassis with the multicore Propeller microcontroller.

- Versatile Propeller Activity Board (see page 02) perched atop our sturdy aluminum chassis.
- High-speed servos go up to 3x faster than the classic Boe-Bot continuous rotation servos.
- Optical encoders and wheels with secure O-ring tires ensure straight and consistent maneuvers.
- Full online suite of tutorials.
- Includes additional electronic components including infrared, whisker, light and ultrasonic sensors, plus a microSD card for data storage.
- The Activity Board's peripheral sockets and the chassis' expansion slots allow for customization with optional accessories.

**Boe-Bot Robot Kit - Serial (w/USB adapter) #28132; \$159.99 and USB #28832; \$159.99**

Our original BASIC Stamp-based Boe-Bot robot is our most popular way to learn robotics programming. This kit comes with all hardware and components including the printed *Robotics with the Boe-Bot* text to aid in assembly and programming in PBASIC.

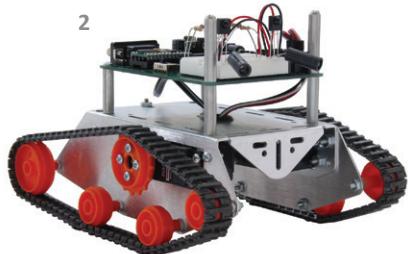
Already own an Arduino? Just grab our **Robotics Shield Kit (for Arduino) #130-35000; \$129.99** and get rolling. Arduino microcontroller not included. Tutorials for this robot kit based on the *Robotics with the Boe-Bot* lessons are available on our Learn site at [learn.parallax.com/ShieldRobot](http://learn.parallax.com/ShieldRobot).

**\*New product. See [Parallax.com](http://Parallax.com) for pricing.**

1



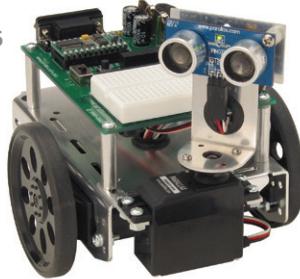
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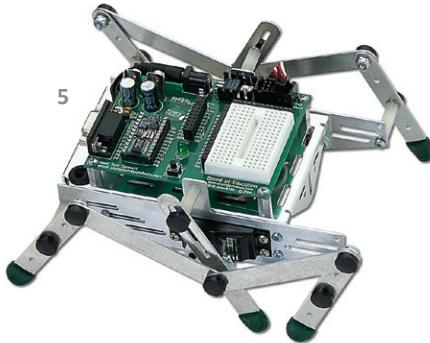
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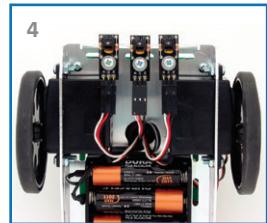
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5



4



**Note:** Robot not included with any of the accessory kits on this page.

**1. Digital Encoder Kit #28107; \$39.99** Get wheel position feedback to improve dead-reckoning, solve mazes, and map paths of travel.

**2. Boe-Bot Tank Tread Kit #28106; \$34.99** Replace the wheels of your robot with the gears and tread in this kit to traverse unfriendly terrain.

**3. Li-ion Boe-Bot Power-Pack Charger #28988; \$44.99** Upgrade from the 4-cell AA battery pack to provide up to 6 hours of continuous motorized operation. Recommended for use with our High Capacity Li-ion Cell and 7.5 VDC, 1 Amp Power Supply (not included).

**4. QTI Line Follower AppKit for the Boe-Bot #28108; \$29.99** Enhance the line-following capability of your robot with this extra set of IR "eyes" on the ground.

**5. Boe-Bot Crawler Kit #30055; \$29.99** Give your Boe-Bot legs without modifying your code.

**6. PING))) Mounting Bracket Kit #570-28015; \$24.99 and PING))) Ultrasonic Distance Sensor #28015; \$29.99** Enable autonomous navigation with a 180° sweep of the surroundings.

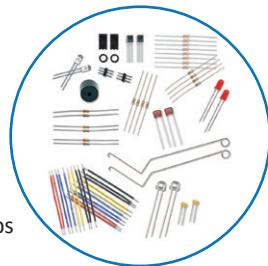


#### Boe-Bot Refresher Pack

**#572-28132; \$9.99**

Missing a few (or a lot of) Boe-Bot electronic components? Consider the Refresher Pack.

It's the same bag of electronic parts that ships with brand new Boe-Bot Robot Kits. Every sensor, wire, capacitor, resistor, LED, phototransistor and piezo-speaker is included in this pack.

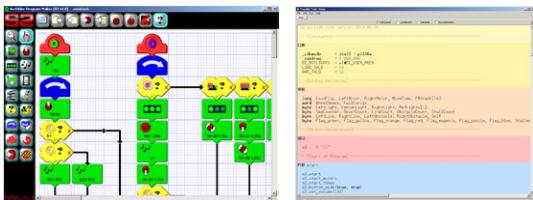


## BEST FOR BEGINNERS:

### Scribbler 2 (S2) Robot

- USB (w/Serial Adapter) #28336; \$119.00
- Serial #28136; \$109.99

No experience needed. Pre-programmed, re-programmable, and hackable. The Scribbler 2 (S2) robot is suitable for a whole variety of programming skills. The Scribbler 2 robot arrives pre-programmed with eight demo modes, including light seeking, object detection, object avoidance, line following, and art. Place a marker in the pen port and it will scribble as it drives. Next, use the Graphical User Interface (S2 GUI) tile-based programming tools, or modify the Propeller source code in our object based Spin language. An especially handy download, '*Robots For Beginners Workshop for the S2*' is also available on our web site.



## READY TO COMPETE?

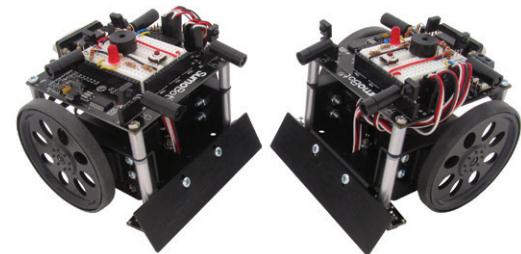
### SumoBot Robot Competition Kit

#27402; \$239.99 - Build and program two SumoBot robots designed to battle in their own mini-sumo competition ring. Follow the *SumoBot Manual* assembly instructions and test programs to go from basic moves to one-on-one combat. Once you have your SumoBot robots up and running, give them a competitive edge and expand your skills by following the step-by-step activities in *Applied Robotics with the SumoBot*. Activities in this advanced text include friction analysis, self-calibrating sensors, memory optimization with multipurpose variables and a sensor flags register, and state-machine diagrams for sensor-based navigation.

#### *Additional purchasing option:*

### SumoBot Robot Kit #27400; \$159.99

Includes electronics and hardware for a single SumoBot robot and the SumoBot Manual.



# PARALLAX EDUCATION

## Worldwide Commitment to Education

For over 15 years Parallax has been committed to STEM (science, technology, engineering, and mathematics) education. Parallax provides teachers, students, and self-learners the material they need to learn microcontroller and robotics programming. A variety of educational texts and kits have been designed for hands-on learning, starting from circuit design and continuing to advanced robotics. Schools around the world use Parallax tools and hardware.



## Parallax Education is Different

- **Low Cost** – Learners can get started with their own robot for around \$200.
- **Beginner friendly** - No programming experience needed.
- **Open platforms** - Exposed circuitry allows you to learn and create your own electronic circuits.
- **Solder free** - Experiment with custom circuits on breadboards (no special-brand connectors).
- **Texts & Tutorials** – Texts and tutorials on [Learn.parallax.com](http://Learn.parallax.com) provide easy-to-follow tutorials.
- **Programming** – PBASIC, Spin or C for Propeller are easy to learn and introduce concepts found in most programming languages.
- **Expandable Platforms** – Allows for add-on sensors, autonomous navigation, & hardware expansion kits.
- **Trainings** – Parallax educator trainings based on our kits take place around the world.
- **Elementary to University Level** – Customize activities and difficulty level. Pick the right hardware for your level.
- **Custom Kits** – Combine our parts and make a special kit, just for your students to purchase on our site.
- **Samples** – Qualified teachers may send a sample kit request to [schoolsamples@parallax.com](mailto:schoolsamples@parallax.com).
- **Forums** – A public education forum as well as a private forum just for educators - includes solution sets and presentations.

BASIC Stamp Education	Multicore Education	<a href="http://Learn.Parallax.com">http://Learn.Parallax.com</a>	Tutorials & Translations	Educator Training Classes
Circuit building, PBASIC programming, and robotics with the BASIC Stamp microcontroller.	Propeller C learning system with circuit building, programming, and robotics.	Teacher resources, tutorials, applications, testimonials, and contest ideas.	Find microcontroller texts and guides translated in over 10 different languages!	Attend a class and learn about teaching with the BASIC Stamp or Propeller microcontrollers.

# ROBOT PLATFORM KITS: ASSEMBLY REQUIRED

**18" Round Robot Base #28960\*** and **18" Round Upper Deck #28965\*** A high-quality, 3/8" thick disc machined in the USA. Ideal for medium-sized autonomous robotics system development, this sturdy platform can handle indoor and outdoor environments quite well. HDPE is a perfect material for a robot base because it can be drilled, cut, modified, and shaved with common wood-working tools and it's impervious to water so it won't swell, crack, or splinter like wood.



\*New products. See [Parallax.com](http://Parallax.com) for pricing.



Ready to build your own custom mid-sized robot? Parallax offers robotic platforms, wheel kits, development boards, sensors, components, hardware, and accessories to bring your robot to life.



**Wild Thumper Robotics Kit #28192; \$350.00** This platform is rugged and designed to excel at traversing rough terrain and steep inclines, making it a great platform for performing tasks in a complex outdoor environment. The unique suspension system acts to keep each wheel in contact with the ground to enable maximum traction, even over rough or bumpy terrain. Includes a Propeller Project Board and HB-25 Motor Controllers.



**Dagu Rover 5 Tracked Robot Chassis with Encoders #28190; \$49.99** This tracked chassis makes a great base for building a small tank-like RC vehicle or autonomous robot. The chassis includes a battery holder and two DC motors; with an independent drive train and a quadrature encoder for each tread. You supply a robot controller and the sensors of your choosing.



Parallax produces its core products and knowledge in Rocklin, California, to speed the prototype to production process while using the most appropriate manufacturing process for the product's design. Learn more about our manufacturing process.

### When we use our "Made in the USA" sticker

- The core of the product has undergone a substantial transformation from raw materials to the finished good
- The cost of our labor (manufacturing and overhead) in relation to the total product's cost exceeds 75%

### Parallax Manufacturing

#### Our board production process:

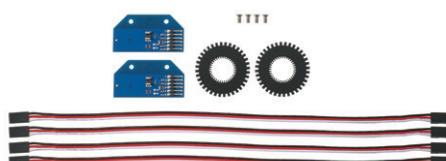
1. Solder Paste Printer adds soldering paste.
2. Pick and Place Machine places components on board.
3. Reflow oven heats paste and solders components on board.
4. Boards are visually inspected, tested, and packaged for sale.



**Motor Mount and Wheel Kit Rev.B with Position Controller #28962\*** Precision machined, mechanical drive system designed primarily for mobile robotic platforms. The motors are worm-gear driven, and the main drive axle (1/2" dia.) is cradled in a ball-bearing assembly, assuring smooth-rolling performance for your robotic creation.

#### Caster Wheel Kit Rev.B

**#28961\*** One of the highest quality caster wheels available; this kit was designed to work well with the Motor Mount and Wheel Kit with Position Controller.



**36-Position Quadrature Encoder Set #29321; \$29.99** Provides rotational feedback for the Motor Mount and Wheel Kit with Position Controller and other 1/2 inch axle systems.

# ELEV-8

# Multicopters



**ELEV-8 Quadcopter Kit #80000; \$599.00** This flying robotic platform is lifted and propelled by four fixed rotors. Aircraft stabilization is electronically controlled by the HoverFly board with Parallax's Propeller multicore microprocessor. Kit includes: frame, mounting hardware, motors, speed controllers, propellers and the control board for flight stabilization. The only thing you need to provide is the RC radio equipment and a battery. We recommend a six channel RC radio.

The ELEV-8 platform is large enough for outdoor flight and has plenty of room for payload and attachments (up to 2 lbs).

#### Key Features:

- Open under-body for mounting accessories
- Modular frame allows for fast repairs and parts swapping
- High-strength chassis keeps your electronic components safe and protected
- Uses common 4-40 mounting hardware that can be found at most local hardware stores

#### Application Ideas:

- Land mapping and surveying
- Real-estate observations
- Aerial video

*This kit is not for beginners, it requires a moderate amount of mechanical skill to build and fly. The kit requires an average of 8 hours to assemble; RC experience is highly recommended.*



**ELEV-8 Hex Upgrade Kit #80040; \$179.00** Add 2 more pounds of payload capacity to your copter.

**ELEV-8 Crash Pack #80080; \$44.99** Includes the components most commonly damaged in a crash. Get back in the air quickly.



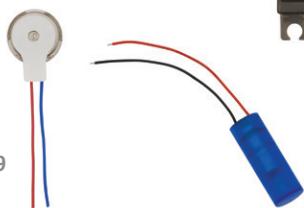
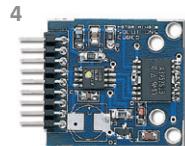
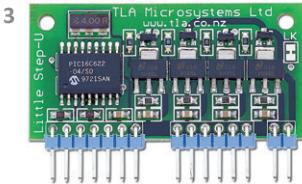
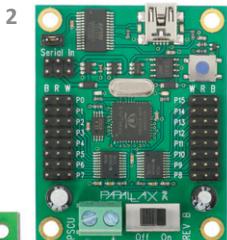
**ELEV-8 Airframe & Hardware Kit #80090; \$179.99**

Use the electronic components of your choosing, while beginning with a high quality airframe as your foundation.



**Visit our web site for more ELEV-8 accessories.**

# MOTOR CONTROL



## 1. HB-25 Motor Controller #29144; \$49.99

Control up to 2 DC motors as simply as you would servos.

## 2. Propeller Servo Controller USB #28830; \$39.99

Control up to 16 servos.

## 3. Little Step-U #27938; \$69.99

Control a unipolar stepper motor with full step, half step and wave drive modes.

## 4. Motor Mind B #27961; \$29.99

Provides DC motor speed and directional control. (6 to 30 VDC).

## 5. Dual Motor Driver MC33926 #28820; \$29.99

Can supply up to 2.5 A continuous current per channel to two brushed DC motors at 5 – 28 V.

## 6. Geared Motor 12 V, 200 RPM #750-90003; \$19.99

Powerful 12 V DC Geared Motor with 200 RPM output provides the necessary power to be the muscle in your next robot.

## 7. Continuous Rotation Servo #900-00008; \$12.99 and Standard Servo (not pictured) #900-00005; \$12.99

## 8. High Speed Continuous Rotation Servo #900-00025; \$16.99

An excellent drive motor for small, zippy robots this servo has about 3 times the RPM of our original continuous rotation servo. Easily control bi-directional rotation via simple pulse width modulation.

## 9. Vibration Motor Flat Coin #28821; \$3.99 and Vibration Motor Capsule #28822; \$4.99

Use for feedback of handheld devices, touch screen feedback, emergency alerting, simulations, video gaming, and other operator feedback applications.

# Sensors



## Ping))) Ultrasonic Distance Sensor #28015;

**\$29.99** Provides an easy method of distance measurement. This sensor is perfect for any number of applications that require you to perform measurements between moving or stationary objects.



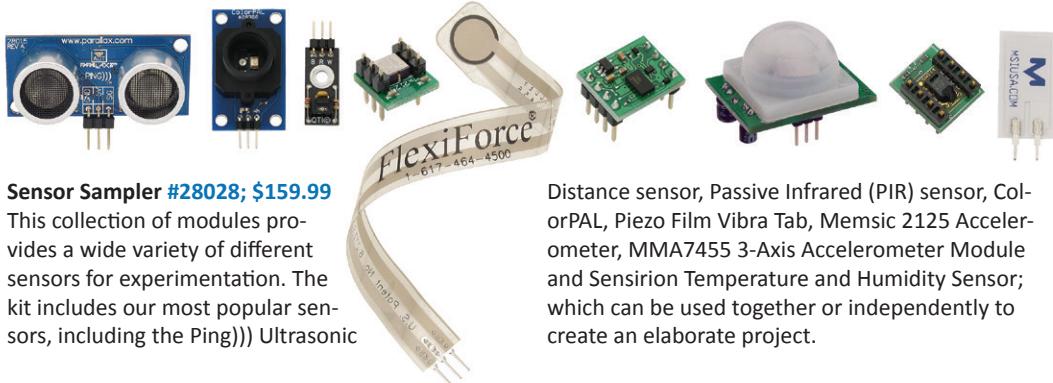
## Additional accessories:

Ping))) Mounting Bracket Kit #570-28015; \$24.99

Ping))) Protector Stand #725-28015; \$14.99

and Acrylic Ping))) Stand with Hardware  
#725-32008; \$8.99

Enhance your project! Parallax sensor modules are designed to be high-quality, easy-to-use and have a minimal footprint. Many of our sensors are compatible with most 3.3 V and 5 V microcontrollers.

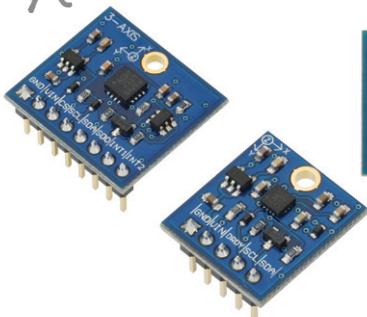


## Sensor Sampler #28028; \$159.99

This collection of modules provides a wide variety of different sensors for experimentation. The kit includes our most popular sensors, including the Ping))) Ultrasonic

Distance sensor, Passive Infrared (PIR) sensor, ColorPAL, Piezo Film Vibra Tab, Memsic 2125 Accelerometer, MMA7455 3-Axis Accelerometer Module and Sensirion Temperature and Humidity Sensor; which can be used together or independently to create an elaborate project.

# ACCELERATION & TILT



**Gyroscope Module 3-Axis L3G4200D #27911; \$29.99** Provides orientation data in X, Y, and Z coordinates. Raw angular rate and temperature data measurements are accessed from the selectable digital I<sup>2</sup>C or SPI interface.

**Compass Module 3-Axis HMC5883L #29133; \$29.99** Designed for low-field magnetic sensing with a digital interface. Perfect to give precise heading information.

**Altimeter Module MS5607 #29124; \$29.99**

Measures height above sea level using barometric pressure. This high resolution (20 cm) altimeter sensor will give extremely accurate altitude, pressure, and temperature readings.



**Memsic 2125 Dual-Axis Accelerometer #28017; \$29.99** This dual-axis thermal accelerometer is capable of measuring tilt, acceleration, rotation, and vibration with a range of ±3 G.

**MMA7455 3-Axis Accelerometer Module #28526; \$29.99** A low power sensor capable of measuring acceleration along its X, Y, and Z axes. It offers several integrated features including an analog to digital converter (ADC), digital low-pass filter, and selectable sensitivity ranges of ±2 G, ±4 G, or ±8 G.

**4-Directional Tilt Sensor #28036; \$9.99** Optical system provides positional feedback in four directions. Measures tilt forward, backward, right-side and left-side.



**GAS**

**Gas Sensor Board #27983; \$24.99** Our updated Gas Sensor Board is socketed, so just grab the gas sensor component of your choice and plug it in. Board interfaces to a microcontroller with only two I/O pins.

- Carbon Monoxide Gas Sensor #605-00007; \$5.99
- Methane Gas Sensor #605-00008; \$4.99

- Propane Gas Sensor #605-00009; \$4.99
- Alcohol/Benzene Gas Sensor #605-00011; \$4.99

# GPS



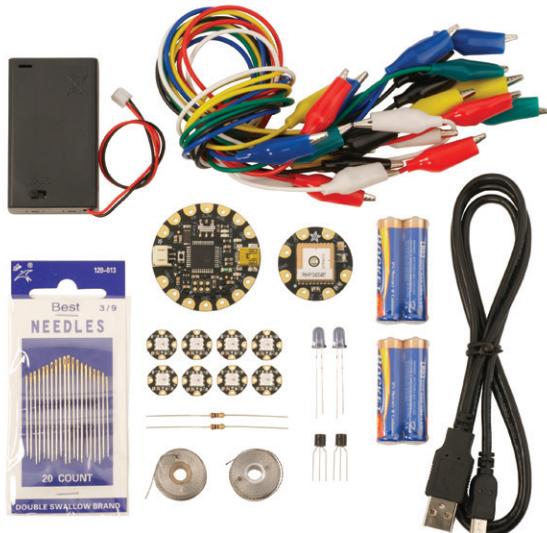
**PMB-648 GPS SiRF Internal Antenna #28500; \$39.99** Features 20 parallel satellite-tracking channels for fast acquisition. Outputs NMEA0183 v2.2 data for robotics navigation, telemetry, or experimentation. There is a built-in patch antenna, rechargeable battery for memory and RTC backup, cable for power, and TTL and RS-232 connections. Not compatible with the external antenna.

**PMB-688 GPS SiRF Internal/External Antenna #28501; \$39.99** Features 20 parallel satellite-tracking channels for fast acquisition. Outputs NMEA0183 v2.2 data for robotics navigation, telemetry, or experimentation. There is a built-in patch antenna as well as a connection for an external one, rechargeable battery for memory and RTC backup, cable for power, and TTL connection. Compatible with the external antenna.

**External GPS Antenna (PMB-688) #28502; \$9.99** Allow your PMB-688 GPS receiver to lock onto more satellites, to increase its accuracy.

## WEARABLES

**FLORA GPS Starter Pack #28507; \$99.95** Looking for the perfect way to get started with wearable electronics? Look no further than the FLORA GPS Starter Kit. Developed by Adafruit Industries, this kit contains all the components necessary to complete several fun wearable projects. Robust, beginner-friendly microcontroller platform for both sewing and electronics novices. Includes a variety of sensors able to power a myriad of wearable projects. Compatible with Li-Ion/Li-Poly, LiFe, alkaline or rechargeable NiMh/NiCad batteries of any size, providing power flexibility. Application ideas include: location-aware clothing, night-time jogging attire, and wearable remote control.





# tR (infrared)

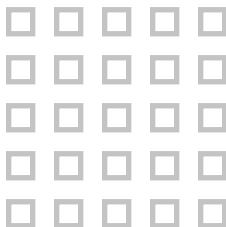
**1. Si1143 Gesture Sensor #28046; \$29.99** Read non-contact gestures for microcontroller applications. Detect up, down, left, right and center select gestures by measuring infrared light levels from the three onboard IR LEDs.

**2. QTI Sensor #555-27401; \$9.99** An IR emitter/receiver that is able to differentiate between a dark surface (low IR reflectivity) and a light surface (high IR reflectivity). Great for line following, maze navigation, or sensing the outer rim of a SumoBot ring. Can be used digitally for fast black/white line following, or as an analog sensor to detect different shades of gray.

**3. PIR Sensor #555-28027; \$10.99** The Passive Infrared (PIR) Sensor detects motion by measuring changes in heat through the infrared levels emitted by surrounding objects. When motion is detected, the PIR sensor outputs a high signal on its output pin.

**4. Pololu IR Beacon Transceiver #28049; \$27.99** This beacon and receiver pair can be used to build pairs of robots that interact or chase one another, or to make a robot that can identify and return to a home base. Ideal for autonomous robot contests in which robots compete in pairs.

**5. Sharp IR Sensor #28995; \$12.99** Measure distance using a beam of infrared light reflected off an object. Using triangulation of the beam of light to calculate the distance, this sensor provides consistent and reliable readings. The sensor outputs an analog voltage corresponding to the distance of the object, and can easily be read using an inexpensive analog to digital converter (ADC) chip. Easily mount your Sharp IR Sensor to your project with the **(6.) Acrylic IR Stand with Hardware #725-28995; \$8.99**





**Laser Rangefinder #28044; \$99.99** This sensor uses laser technology to calculate the distance to a targeted object. The design uses a Propeller processor, CMOS camera, and laser diode. Distance to a targeted object is calculated by optical triangulation using simple trigonometry between the centroid of laser light, camera, and object. Measure up to 8 feet with optimal range of 6-48 inches with <5% accuracy error.



COLOR & LIGHT



**ColorPAL #28380; \$19.99** To sense color, the ColorPAL uses its LED to illuminate a sample, one color component at a time, along with a broad-spectrum light-to-voltage converter to measure the light reflected back. The amount of light reflected from the sample under illumination from each red, green, and blue LED is used to determine the sample's color.

**TSL235R Light to Frequency Converter #604-00084; \$2.99 and TSL237 Light to Frequency Converter #604-00085; \$2.99** A silicon photodiode and a current-to-frequency converter on a single integrated circuit. Converter outputs a square wave (50% duty cycle) with frequency directly proportional to light intensity. It is TTL compatible, allowing direct interface to a microcontroller or other logic circuitry. UV-to-visible light range of 320 nm to 700 nm and responds to light range of 320 nm to 1050 nm.



*The following two modules plug directly into the BASIC Stamp-2pe Motherboard (#28300), Propeller Backpack (#28327), or interface to any other boards using the optional DB-Expander SIP Converter (#28325).*

**TCS3200-DB Color Sensor #28302; \$59.99** A complete color detector, including a TAOS TCS3200 RGB sensor chip, white LEDs, collimator lens, and standoffs to set the optimum sensing distance. Able to read small color swatches.

**TSL1401 Linescan Sensor Daughterboard #28317; \$49.99** Provides one-dimensional sight to almost any microcontroller allowing you to recreate an image from a scan. Includes the TAOS TSL1401R 128-pixel sensor chip, a 7.9 mm focal length imaging lens, and control electronics to aid in capturing images for evaluation. It produces a clocked analog data output, whose voltage levels correspond to the light intensity at each pixel.

# TEMPERATURE & HUMIDITY

## Sensirion Temperature/Humidity

### Sensor #28018; \$42.99

Humidity can be difficult to measure, requiring external circuitry and many calculations by most other sensors. With our module, all your microcontroller has to do is read out the temperature and humidity values through the two-wire digital serial interface. The resolution of the sensor is quite remarkable and is excellent for commercial or home-based projects that require a high degree of resolution.



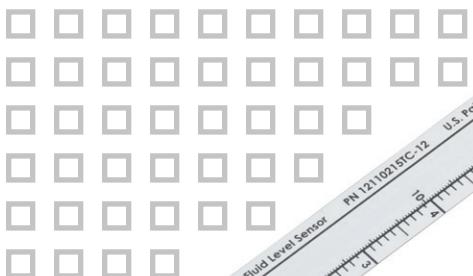
### HS1101 Humidity Sensor #27920; \$8.99

Based on a unique capacitive cell, this relative humidity sensor component is designed for high-volume applications such as office automation, automotive cabin air control, home appliances, and industrial process control systems. It is also useful in all applications where humidity compensation is needed.



### LM34 Temperature Sensor #604-00011;

**\$6.99** The LM34 is a precision Fahrenheit temperature sensor in a standard TO-92 package suitable for remote applications or direct PCB mounting. The LM34 has a wide operating voltage range of 5 to 30 volts DC and a temperature range of +32° to +212°F.



# PRESSURE & FLEX

### Flexiforce Sensor Kit (25 lbs.) #30056; \$24.99

This ultra-thin (0.008 in.) flexible sensor can be easily integrated into force measurement applications. With this kit you can: detect and measure a relative change in force or applied load; detect and measure the rate of change in force; identify force thresholds and trigger appropriate action; or detect contact and/or touch.



### SCP1000 Pressure Sensor Module

### #29135; \$24.99

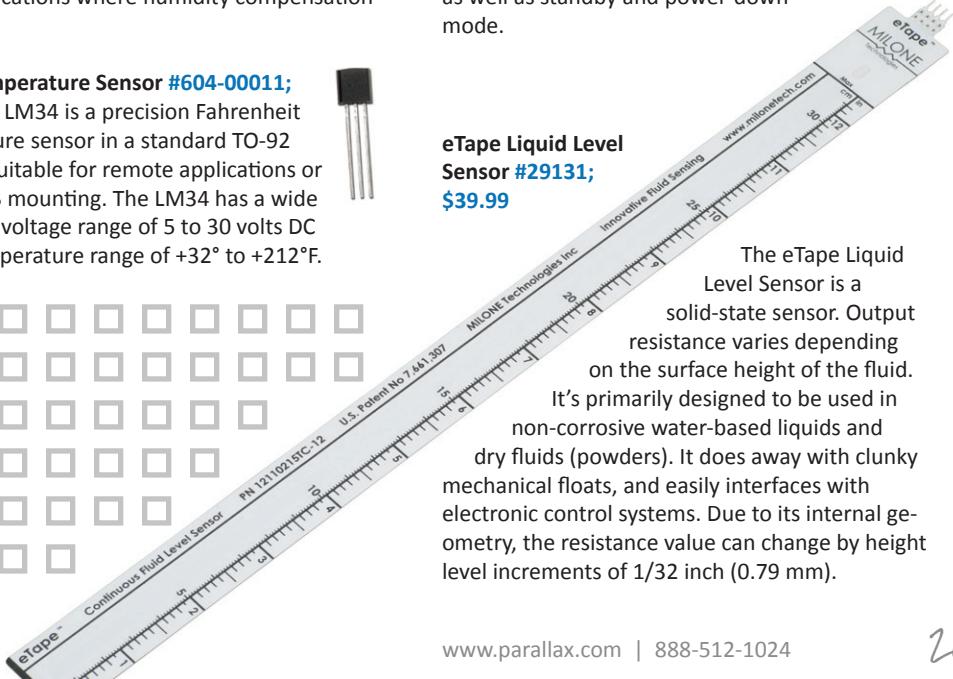
This absolute pressure sensor can detect atmospheric pressure from 30-120 kPa. The pressure data is internally calibrated and temperature-compensated. The SCP1000 also provides temperature data and has 4 measurement modes as well as standby and power-down mode.



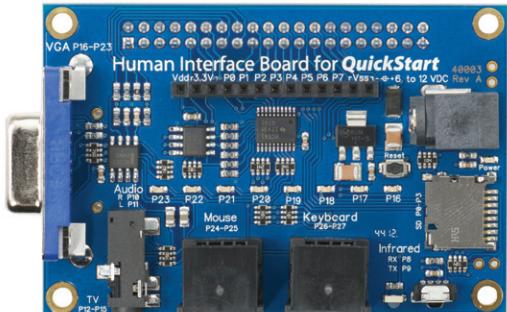
### eTape Liquid Level

### Sensor #29131; \$39.99

The eTape Liquid Level Sensor is a solid-state sensor. Output resistance varies depending on the surface height of the fluid. It's primarily designed to be used in non-corrosive water-based liquids and dry fluids (powders). It does away with chunky mechanical floats, and easily interfaces with electronic control systems. Due to its internal geometry, the resistance value can change by height level increments of 1/32 inch (0.79 mm).



# Human Input Devices



## Human Interface Board for QuickStart #40003;

**\$29.99** The Human Interface Board stacks directly on top of the QuickStart development platform (see page 03), creating a minimal footprint for both boards. With multiple audio and video outputs and keyboard or mouse inputs, as well as a microSD card socket, the Human Interface Board can add an interactive interface to any project. Where applicable, the Human Interface Board uses the same I/O pin assignments as the Propeller Demo Board peripherals. Like the QuickStart development platform, the Human Interface Board is an open-source hardware design, so all design files are available under licenses that allow free distribution and reuse.



**Trackball Module #27908; \$15.99** Similar to the trackball once found on smart phones, this sensor is easily portable and can be used to replace a mouse in many applications. The Trackball Module comes with a built in center select switch and a red LED which can be programmed to light up the trackball when desired.

## Optical Finger Navigation (OFN) Module #27903;

**\$19.99** OFN technology is similar to the technology used in optical mice, and movement across the sensor can be read by any microcontroller using I<sup>2</sup>C communication. Built-in center select button and onboard red LED which illuminates when finger movement is detected. Great for video game input and user input for computing devices.



**Piezo Film Vibra Tab #605-00004; \$2.50** This vibration sensor is model LTD0, manufactured by Measurement Specialties. Whether used as a vibration sensor or a flexible switch, piezo film is an interesting sensor to interface with Parallax microcontrollers. For example, it is easy to use with the COUNT or PULSIN commands on a BASIC Stamp.

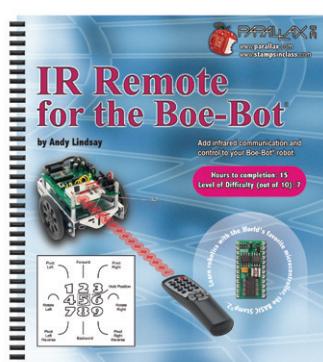


**1. 2-Axis Joystick #27800; \$3.99** Add analog input to your next project. Contains two independent potentiometers (one per axis) for reporting the joystick's position. The modular form-factor allows you to plug the 2-Axis Joystick directly into a breadboard for easy prototyping. The 2-Axis Joystick includes spring auto return-to-center and a comfortable cup-type knob.

**2. 5-Position Switch #27801; \$9.99** Perfect for video game & robot controllers, the 5-Position Switch is a normally open contact switch. It has a nice snappy feel and returns to the center position immediately when released.

**3. Incremental Rotary Encoder #27805; \$4.99** This encoder provides 16 pulses per revolution via 2-bit quadrature outputs. 3-pin SIP header provides easy breadboard connection. This encoder rotates continuously through 360 degrees and provides detent to hold position. Used with a pushbutton this encoder could provide a complete menu/input system for your microcontroller.

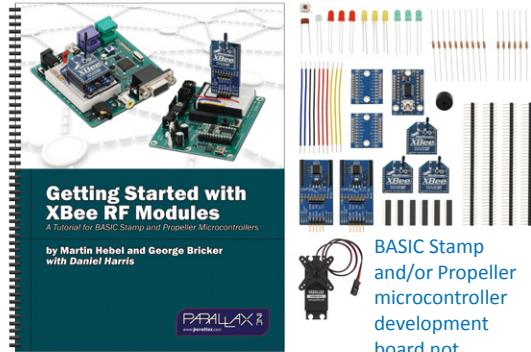
**4. Propeller Peripherals Kit #32311; \$99.99** Explore the power of the Propeller microcontroller with this keyboard, mouse, and display. Driver objects are provided with our Propeller Tool software; use and modify the example objects or write your own.



**5. IR Remote for the Boe-Bot Parts Kit and Text #28139; \$34.99** This 175-page text focuses on adding infrared communication and control to your Boe-Bot robot. You can directly control the robot, game-controller style, remotely set roaming speed and distance, combine remote control and autonomous roaming functions, and remotely select autonomous roaming modes. Boe-Bot robot not included (see page 08).

# Wireless Communication

**XBee 802.15.4 Starter Kit #32450; \$179.99** XBee modules provide a versatile RF communication solution for BASIC Stamp and Propeller microcontroller projects. Ready to use for bi-directional, point-to-point communication in their default state, XBee modules can also support complex networking with additional configuration via serial commands sent from your microcontroller, or through Digi's free X-CTU software. The tutorial introduces basic and advanced setups with XBee 802.15.4 projects you can do on your desktop. It features both BASIC Stamp and Propeller code examples, allowing you to see similar code running in both of these Parallax microcontrollers.



BASIC Stamp  
and/or Propeller  
microcontroller  
development  
board not  
included.

## PCB Antenna Modules:

- XBee 1 mW PCB Antenna (XB24-API-001) #32404; \$21.99
- XBee PRO 60 mW Chip Antenna (XBP24-ACI-001) #32406; \$36.99

## Wire Antenna Modules:

- XBee 1 mW Wire Antenna (XB24-AWI-001) #32405; \$21.99
- XBee PRO 60 mW Wire Antenna (XBP24-AWI-001) #32407; \$36.99
- XBee ZigBee PRO S2B 63 mW Wire Antenna (XBP24BZ7WIT-004) #32408; \$37.99
- XBee ZigBee 1.25 mW Wire Antenna (XB24-Z7WIT-004) #32409; \$24.99

## Not compatible with other modules:

- XBee 900HP Module #32411; \$39.00 and Digi 900 MHz Antenna #32410; \$20.00

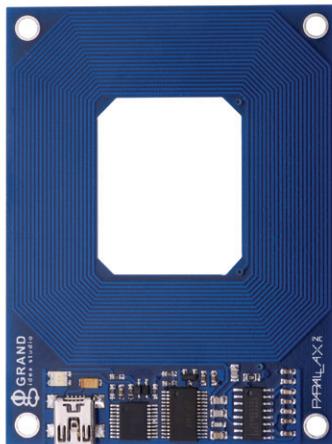
These adapter boards provide an easy interface to the XBee/XBee Pro modules by converting the 2 mm pin spacing to breadboard-friendly 0.1 inch spacing.

## Adapter Boards (some soldering required):

- XBee USB Adapter Board #32400; \$23.99
- XBee 5V/3.3V Adapter Board #32401; \$14.99
- XBee SIP Adapter #32402; \$27.99
- XBee Adapter Board #32403; \$2.99



Our RFID Reader Modules are convenient solutions to read EM 4100 low-frequency (125 kHz) passive RFID transponder tags. RFID Reader Modules can be used in a wide variety of hobbyist and commercial applications, including access control, automatic identification, robotics, navigation, inventory tracking, payment systems, and car immobilization.



U.S. Patent Nos. RE40,145; 5,817,207; 6,036,099; 6,214,155; 6,514,367; and 6,557,766

- **RFID Reader Module (Serial) #28140; \$42.99**
- **RFID Reader Serial + Tag Sampler #32390; \$47.99**

Compatible w/most 3.3 and 5 V microcontrollers.

- **RFID Reader Module (USB) #28340; \$42.99**
- **RFID Reader USB + Tag Sampler #32395; \$47.99**

Compatible with most personal computers.

- Read-compatible only tags:*
- RFID 54 x 85 mm Rectangle Tag #28141; \$2.50**
  - RFID 50 mm Round Tag #28142; \$1.99**
  - RFID Nail Tag #28446; \$2.99**
  - RFID Clear Disc Tag #28449; \$2.49**
  - RFID 30 mm Epoxy Disc Tag #28448; \$2.49**
  - RFID 12.4 mm Round Tag #28445; \$2.49**



[www.parallax.com](http://www.parallax.com)

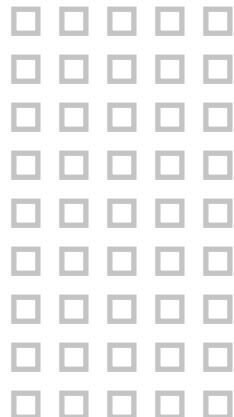
**RFID Read/Write Module (Serial) #28440; \$49.99**  
Reads and writes EM4x50 transponder tags. Compatible with most 3.3 and 5 V microcontrollers.

*Read/write-compatible tags:*

- R/W 54 x 85 mm Rectangle Tag #28441; \$2.89**
- R/W 20 mm Round Tag #32398; \$2.49**
- R/W 30 mm Round Tag #32399; \$2.49**

**433 MHz RF Transceiver #27982; \$39.99** Send and receive serial data wirelessly over a radio link between microcontrollers. Low power consumption makes it ideal for use in battery-powered applications. Provides a range of up to 250 feet. Includes a receive signal strength indicator to determine when another transceiver is present.

**RN-42 Bluetooth Module #30086; \$49.99** Remote control a robot! Communicate wirelessly between two devices such as a microcontroller, PC, cell phone, or another module using Bluetooth. This module can pair-up with devices supporting Bluetooth SPP (Serial Port Profile) to establish a serial interface. Auto-connect/discovery/pairing modes make connecting to other modules easy. This module is breadboard friendly and is compatible with 3.3 and 5 V microcontroller platforms. Low power consumption for long-lasting battery-powered projects.



## SMART CARDS

**Smart Card Reader #32320; \$9.99** Smart cards are about the size of a credit card with an embedded IC for storing data. Our Smart Card Reader can be used with the compatible smart cards for a variety of applications such as security systems, data storage, tracking systems, and identity authentication. Easy to interface to most microcontrollers. Reads and writes data to standard memory-based smart cards (not compatible with microprocessor-based smart cards). Card detect switch allows confirmation of smart card insertion.

### IS23SC4442 Smart Card #32321; \$0.99

256 x 8-bit memory with 3-byte programmable security code for write/erase protection

### IS24C16A Smart Card #32322; \$1.29

2048 x 8-bit memory

### IS24C02A Smart Card #32323; \$0.99

256 x 8-bit memory, no security code



# ETHERNET



## Spinneret Web Server, Version 1.0 #32203;

**\$59.99** A stand-alone Ethernet solution. Build your own embedded networked control system with this open source Ethernet-based development board for the Propeller microcontroller. The serial EEPROM has 32 KB for storing a Propeller program and 32 KB for non-volatile data storage, independent of a microSD card. Web page content, files, and logs can be stored on a microSD card. A real-time clock controller can time-stamp files and events, and the backup capacitor will keep the clock running through extended power outages. The serial programming header has two auxiliary I/O connections, one for level-shifted open collector communications over a three-pin data/power/ground cable, and the other is a 12-pin socket for direct 3.3 volt I/O connections. The circuit board contains eight status LEDs, plus two that are repeated on the Ethernet jack.



## WIZ812MJ Ethernet SPI/Bus Module #605-05110;

**\$24.95** Add network capabilities to a project, or develop a design around the WIZNet W5100 network controller. The built-in TCP/IP stack provides a high-reliability Ethernet connection and requires minimal resources from the host microcontroller.



## WIZnet Ethernet Board for QuickStart (W5200)

**#40002; \$49.99** Add Ethernet capability to your Propeller QuickStart board (see page 03). An excellent evaluation tool. Serve data to an Ethernet network or even the Internet. The WIZnet W5200 chip provides an Ethernet-to-SPI bridge which is interfaced with Parallax's 8-core microcontroller—the Propeller P8X32A. The data served to a network can be anything you want—web pages, serial data, email, and more.



**WIZNet Chips.** Full-featured, single-chip 10/100 Ethernet controllers with built-in TCP/IP stacks provide a stable high-performance network connection in a small footprint using minimal microcontroller resources. IEEE 802.3 10BASE-T and 802.3u 100BASE-TX compliant.



## W5100 WIZnet Chip #604-05100;

**\$5.00** Four sockets and a 16-kilobyte buffer with a parallel or SPI interface, for legacy applications.



## W5200 WIZnet Chip #605-05200;

**\$5.00** Eight sockets and a 32 kB buffer with a high-speed SPI interface—more throughput using fewer I/O pins.

# SOUND/AUDIO

## 1. Emic 2 Text-to-Speech Module #30016; \$59.99

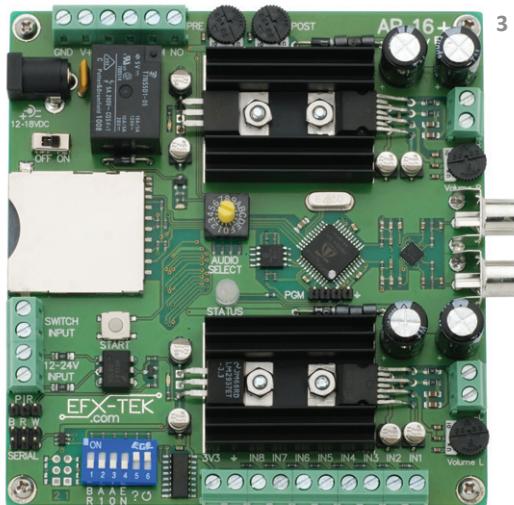
Give your project a voice! Designed by Grand Idea Studio, the Emic 2 Text-to-Speech Module is a multi-language voice synthesizer that converts a stream of digital text into natural sounding speech. Its simple command-based interface makes it easy to integrate into any embedded system.



1



2



3

## 2. FM Radio Receiver Module #27984; \$14.99

The RDA5807SS FM stereo radio tuner chip provides an easy way for your microcontroller to receive local FM radio stations. Using the onboard antenna and headphone jack, you can easily create your own portable radio.

**3. AP-16 Audio Player #31316; \$129.99** Play high-quality, stereo WAV files from a standard SD card through two, booming 20 W amplifiers (one per channel). Control is as simple as loading up your SD card! Advanced features like built-in randomization, auxiliary inputs, and the ability to use dry-contact, (optically isolated) 12 to 24 DC, or a PIR (or compatible) sensor put the AP-16+ in a class of its own.

**4. Sound Impact Sensor #29132; \$8.99** Build a noise-activated alarm system. Sensor detects sound from up to 3 meters away, lending noise-activation possibilities to your microcontroller projects.



4

**5. SoundPAL #28825; \$14.99** A tiny module that plays canned and custom sound sequences. Includes a microcontroller for generating the sounds and a small speaker for producing them. You can easily interface with a BASIC Stamp and you can play sounds while the microcontroller is busy with other tasks.



5

**6. Veho 360 Speaker #900-00018; \$14.99** Large audio in a compact package. Has a built in rechargeable battery. Great for mobile audio.

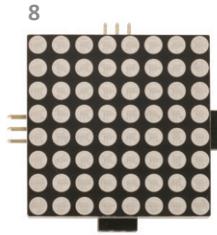
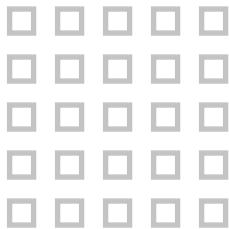


6

# DISPLAYS



7



8



9



10



7. Our serial LCDs (liquid crystal displays) can be easily connected to and controlled by a microcontroller using a single I/O pin. The displays provide basic text wrapping and full control over all of the advanced LCD features. Visible ASCII characters Dec 32-127) are supported. In addition, you may define up to eight of your own custom characters to display anywhere on the LCD.

- **4 x 20 Serial LCD (Backlit) #27979; \$42.99**
- **2 x 16 Serial LCD (Non-Backlit) #27976; \$27.99**
- **2 x 16 Serial LCD (Backlit) #27977; \$29.99**

8. **8 x 8 RGB LED Matrix Display Module #32324; \$39.99** Add 64 brilliant, colorful LEDs to your next project! Each pixel in the display's 8 x 8 matrix can display millions of different colors. Based on the Propeller P8X32A, the display comes pre-programmed with feature-rich firmware supported by a detailed command set. Control the module from a single microcontroller I/O pin.

9. **Mini LCD A/V Color Display #603-32000; \$89.99** This 7" LCD TV can receive broadcast and baseband NTSC and ATSC video signals. It features a 480 x 234 pixel color screen and built-in speakers. It includes an antenna and a power supply and has a built-in battery. Conveniently portable, this product can display NTSC video output generated by the Propeller chip or any other device which has an Audio/Composite Video Out connector.

10. Add multimedia and interactivity to your project in astounding color! Simple serial connection to your favorite microcontroller. Use the expandable memory space for multimedia files, including movie clips or sound files. Cable included.

- **3.2" LCD Touch Screen Display with Adapter and 2 GB micro-SD Card #28080; \$106.00**
- **3.2" LCD Touch Screen Display #28083; \$79.99**
- **2.8" LCD Touch Screen Display #28082; \$69.99**
- **Programming Adapter #28072; \$19.99**

# Tools

1. Our soldering kits include a PanaVise circuit board holder, soldering iron, diagonal cutters, tip-cleaning sponge, roll of (leaded) solder, a standoff holder for the solder roll, and mounting hardware.

- **Pro Soldering Tool Kit #700-10018; \$199.00**

Includes a Hakko #FX888D soldering station, and a hand-held vacuum solder sucker.

- **Basic Soldering Kit (not pictured) #700-10011; \$79.00** Includes a Hakko #508 soldering iron.



2. Make cutting and stripping wires fast and easy. Flush cut with one end and auto strip with the other end of this versatile tool.

- **6" Two-in-One Wire Cutter & Stripper #700-10002; \$12.99**

- **5" Two-in-One Wire Cutter & Stripper #700-10001; \$9.99**



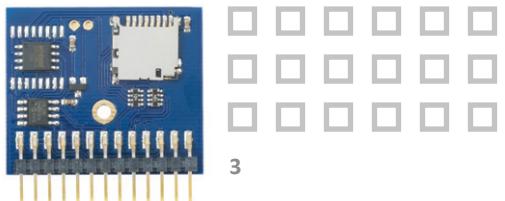
3. **Propeller Memory Card #40004; \$17.99** Add 32 megabits of flash memory, one megabit of SRAM, and a microSD card socket to a breadboard project, or plug it directly into a Human Interface Board (page 22) on a Propeller QuickStart. *Not BASIC Stamp compatible.*

4. **SD Card Adapter Kit #32313; \$14.99** Soldering and assembly required. Allows you to easily connect an SD Card to your Propeller project. *Not BASIC Stamp compatible.*

5. **microSD Card Adapter #32312; \$14.99** Easily connect a microSD Flash Memory Card to your Propeller project. *Not BASIC Stamp compatible.* This adapter contains the components required for an SPI interface between the host microcontroller and a microSD card, such as the **1 GB microSD Card #32318; \$7.99** (sold separately).

6. **Parallax USB to Serial (RS-232) Adapter**

- **Adapter Only #28030; \$14.99**
- **With USB Cable #28031; \$17.99**





**PropScope USB Oscilloscope #32220; \$199.99** A two-channel oscilloscope that is capable of reading 25 million samples per second with ten bits of resolution over one, two, ten, or twenty volt peak-to-peak waveforms. Power is provided through the USB port. A PropScope DAC card is included, providing an analog trigger, a four-bit digital trigger, an eight-bit digital to analog converter, and a four-bit NTSC/PAL output. The included software provides a traditional scope interface along with auto measurements and the ability to store and export waveforms.

**Understanding Signals with the PropScope Parts & Text Kit #32225; \$229.00** This kit includes the PropScope USB oscilloscope, electronic components for breadboard circuits, and a printed text that guides you step-by-step from the basics through advanced electronic measurement techniques.



**Logic Analyzer #32314; \$149.99** This is a must-have tool for analyzing, evaluating and “seeing” digital serial communication signals. Monitors up to 8 Channels. Saves up to 10 billion samples. Supports: Windows, Mac or Linux.



**Memory Stick Datalogger #27937; \$39.99** Connect a USB mass-storage device to your BASIC Stamp or Propeller microcontroller and share the files with your PC using simple serial commands. This device is ideal for remote logging of large quantities of data.

# POWER AND SOLAR

**1. 34 Watt Solar Panel Kit #33000; \$139.99** A do-it-yourself system that can produce up to 34 watts of clean electrical energy. Assembly and soldering required.

## Solar Panels:

2. **18 V, 10 W, 340 x 280 mm #750-00032; \$59.99**
3. **9 V, 1 W, 135 x 135 mm #750-00031; \$9.99**
4. **6 V, 1 W, 125 x 63 mm #750-00030; \$9.99**

## 5. Li-Ion Power Pack:

- **Full Kit (Charger w/2 Cells) #28989; \$59.99**
- **2-Cell Charger Only #28986; \$52.99**
- **High Capacity Li-Ion Cell #28987; \$7.99**

An integrated storage cell and charging system on a single 3 x 4 inch printed circuit board. Compatible with most 18650-size Li-Ion cells. 7.5 VDC, 1 Amp Power Supply recommended (not included).

## 6. Tenergy TB6B Balance Charger #752-00009; \$89.99

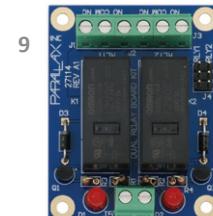
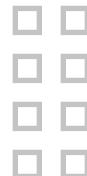
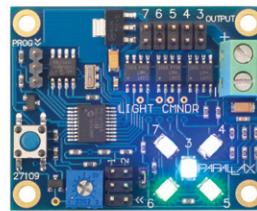
An all-in-one charger that supports multiple battery packs and types for all your applications. Charge batteries and balance LiFe and LIP0 battery packs to ensure longer cycle and battery life.

**7. Light Commander #27109; \$29.99** A multi-output user-programmable power controller. Originally designed as a light controller on the ELEV-8 quadcopter, it is also suitable for switching of high currents under programmable control in other applications.

Turn lights, fans and other devices on/off while keeping them isolated from your microcontroller.

**8. Single Relay Board #27115; \$9.99** Control high-power devices (up to 10 A) via the on-board relay - friendly to servo cables and convenient to connect to many development boards.

**9. Dual Relay Board Kit #27114; \$24.99** Control two high-power devices up to 8 A each via the included Omron mechanical relays. Soldering and assembly required.



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For BASIC Stamp: <http://learn.parallax.com/project/basic-stamp-tilt-tones>

