2004 Product Guide

PARALLAX INC.

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The Parallax 2004 Fall Product Guide is brought to you by Parallax, Inc. and our network of 70+ distributors.

This product guide is unique from all of our previous guides since the pricing is not published next to the Parallax part number and product description.

For pricing information, please visit your distributor's web site or view the included price list (may not be applicable).

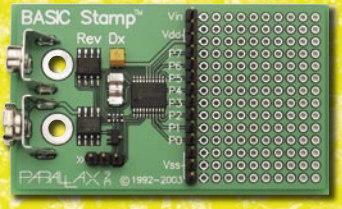
The following 30 pages focus on Parallax's core products, including those which are most often carried by distributors. This includes but is not limited to the following: BASIC Stamp microcontrollers, Programming Boards, Starter Kits, Application Modules, Accessories, Robotics, Motor Control, Education Stamps in Class, Industrial, SX-Key Programming Tools and Chips, Altera FPGA Development Tools. Additional accessories and components may be available from your distributor or www.parallax.com.

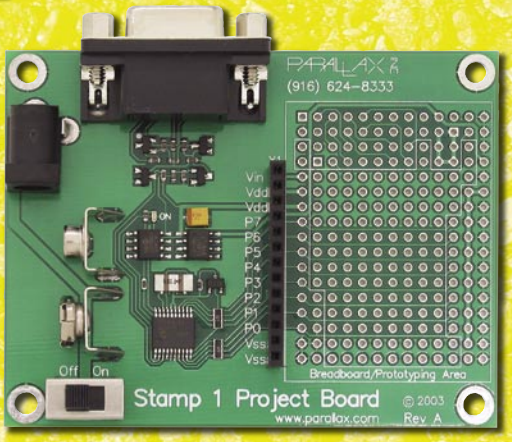
Our distributors are very responsive to customer requests and are able to procure Parallax products that are available from our web site. For international customers, this is of extreme importance since distributors use their expertise to provide you with the best pricing available after paying for overseas shipping charges, duties, and taxes. Typically, international distributor pricing is higher than the suggested retail price since these fees have been covered by the distributor.

your local distributor:

Note: Product description, typographic, and photographic errors are unintentional and subject to change.

BASIC Stamp 1 microcontrollers





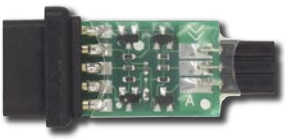
News Flash: All BASIC Stamp® 1 microcontrollers (including the Project Board) are now rated for industrial temperatures (-40°C to +85°C (-40°F to +185°F)).

1. BASIC Stamp Rev Dx Module; #27100 - The original BASIC Stamp module. Often underestimated, but powerful enough for many of your applications. BASIC Stamp microcontroller and programming board all in one package.

2. BASIC Stamp 1 Module; #BS1-IC - Equivalent to the Rev Dx, only in a 14-pin package. Ideal fit for applications with tight space limitations.

3. BASIC Stamp 1 Project Board; #27112 - This project board has a BASIC Stamp 1 microcontroller and Serial Adapter built onto the board! The board includes a 9V battery clip, a mechanically interlocked 2.1 mm power jack, DB-9 connector for programming, and LM 2936 regulator providing 40 mA for your projects.

BASIC Stamp 1 Serial Adapter; #27111 - Add Windows® programming to your BASIC Stamp 1 module (BS1-IC). One end plugs into your serial cable and the other into a 3-pin header.



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BASIC Stamp 2 modules

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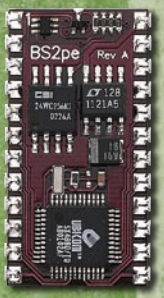

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Parallax has a BASIC Stamp microcontroller to fit every project you can imagine. Programming software is available for Windows as well as Mac and Linux. For a full comparison of BASIC Stamp modules, check out our comparision chart at www.parallax.com.

1. BASIC Stamp 2 Module; #BS2-IC - Widely used in industrial, education and hobbyist applications, the BASIC Stamp 2 microcontroller is the most popular BASIC Stamp module. The BS2-IC has plenty of I/O pins, processing speed, and program space for most designs. No compiler is required, and a serial interface provides enhanced debug features. For first-time customers, we highly recommend that you start with the BASIC Stamp 2 module. The BS2-IC has the most documentation and educational support, making it the ideal choice for understanding the world of the BASIC Stamp module.

2. BASIC Stamp 2e Module; #BS2E-IC - A good fit for your BASIC Stamp 2 projects that require extra program and RAM space. All additional EEPROM and RAM (variables) of the BS2sx module without the associated current draw of higher speed.

3. BASIC Stamp 2sx Module; #BS2SX-IC - The high-speed version of the BS2 module with extra EEPROM, RAM, and faster serial I/O. Ideal for BS2 users who need more horsepower. Only the BS2p modules are faster.

4. BASIC Stamp 2p24 Module; #BS2P24-IC and
5. BASIC Stamp 2p40 Module; #BS2P40-IC
The BS2p modules have several advantages over all previous BASIC Stamp microcontrollers. They're 300% faster than the BS2 module and 20% faster than the BS2sx module. Commands for interfacing with parallel LCDs, Philips® I²C® devices and Dallas Semiconductor™ 1-Wire® parts have been added along with a polled interrupt capability. Available in a regular 24-pin or a larger 40-pin package for 32 extra I/O's.

6. BASIC Stamp 2pe Module; #BS2PE-IC - All the commands of a BS2p, with twice the EEPROM size and lower power consumption. Ideal for a battery-powered or datalogging application. Program execution speed is less than the BS2p24 and p40 at 6,000 instructions/second.

The Stamp Collection; #020-78267 - Try 5 BASIC Stamp modules to meet your every engineering need with The Stamp Collection. The kit consists of the BS1-IC, BS2-IC, BS2E-IC, BS2SX-IC and BS2P24-IC in a plastic box for convenient desktop storage.

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Development Boards

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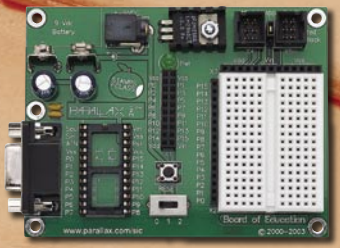

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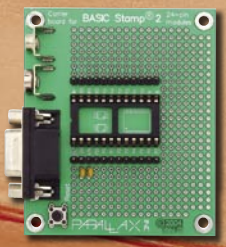

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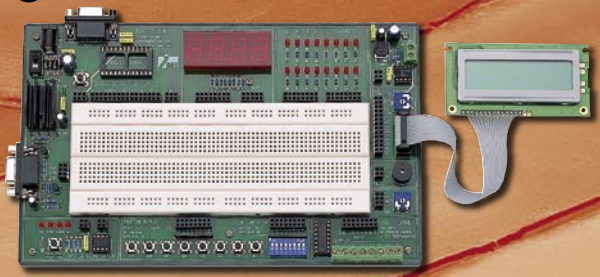

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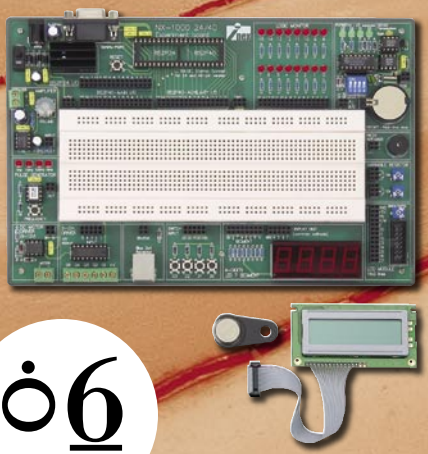

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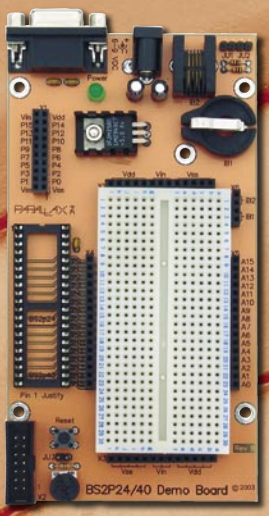

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1. BASIC Stamp Super Carrier Board; #27130 - Ready for some soldering? The Super Carrier Board provides Parallax customers with a solder pad prototyping space and holes placed to accomodate DIP ICs. The Super Carrier is unique because it is one of the few boards that provides support for both the BS1-IC and the complete series of 24-pin BASIC Stamp modules (including the Javelin Stamp).

2. Board of Education® (BOE); #28150 - The BOE was designed in coordination with our educational customers to help make microcontroller programming and interfacing easy. The BOE is available as a separate programming board or you may purchase the BS2/BOE Starter Kit (#27203) or the BASIC Stamp Discovery Kit (#27207).

3. BASIC Stamp 2 Carrier Board; #27120 - Our lowest cost programming board is suitable for small projects. The BS2 Carrier Board has a 24-pin DIP socket that will accomodate all 24-pin BASIC Stamp modules. The board also contains through-hole prototype area, battery clip, and reset button. 9V battery is required (not included).

4. NX-1000 Development Board with LCD; #28135 - The original NX-1000 Board is well-documented by the StampWorks manual which is included in the StampWorks Experiment Kit (#27297). The NX-1000 is a high-quality prototype and experiment area for all 24-pin BASIC Stamp modules. The board features improvements to durability and construction (double-sided plating, improved switch), an audio amplifier for external speakers and current limit resistors sized for driving more LEDs! The board provides socket ports for each BASIC Stamp I/O pin. The package also includes printed documentation, schematics, and source code examples for the BS2-IC. A parallel LCD with cable is also included.

5. NX-1000 24/40 Development Board with iButton®; #28137 - The NX-1000 Board's popularity has spawned a new breed titled the "NX-1000 24/40." The 24/40 designation is appropriate since any 24-pin BASIC Stamp module, or 40-pin BASIC Stamp module, or Javelin Stamp module may be plugged into the socket. Recommended as a development and prototyping platform for customers with a strong programming and electronics background. Due to the I^2C components and a connection for a 1-Wire interface, the 24/40 is the ideal choice for BASIC Stamp 2p series and the BASIC Stamp 2p40 module. In addition the the board, you will receive the following: 12V/1 Amp power supply, documentation, 2x16 Parallel LCD, and a DS1990A-F3 iButton® sample in a plastic fob.

6. BASIC Stamp 2p24/40 Demo Board; #45187 - The Demo Board provides very useful connections to Dallax Semiconductor 1-Wire, Philips I^2C communications components, standard parallel LCDs (with Hitachi HD44780 or compatible chipset) as well as a breadboard prototype space. Will work with all 24-pin BASIC Stamp modules (and the Javelin Stamp module), but is specially tailored to maximize the capabilities of the 24- and 40-pin BASIC Stamp 2p modules.

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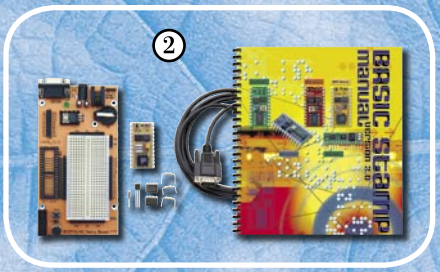
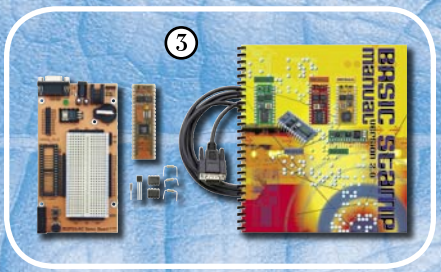
BASIC Stamp Starter Kits





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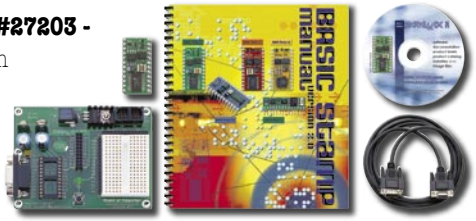
1. BASIC Stamp Discovery Kit; #27207 - In addition to the BASIC Stamp 2 module, Board of Education programming platform, and BASIC Stamp Manual, this kit includes the *What's a Microcontroller?* parts and text kit making it the most thorough way to get started. With the WAM kit you'll go through a series of 40+ activities designed to provide you with the best possible introduction to the world of BASIC Stamp microcontrollers. Programming cable, CD-ROM (software and documentation), and jumper wires are also included. This kit is an excellent choice for schools or anyone interested in learning microcontroller programming.

BS2-IC/Board of Education Starter Kit; #27203 - BASIC Stamp 2 module, Board of Education programming platform, BASIC Stamp Manual, programming cable, CD-ROM (software and documentation), and jumper wires are included in this kit.



2. BASIC Stamp 2p24 Professional Starter Kit; #27235 and
3. BASIC Stamp 2p40 Professional Starter Kit; #27238
Each of the BS2p24 and BS2p40 Professional Starter Kits are presented to engineers with a sampling of components such as a DS1822 thermometer and RTC w/RAM to test and get an immediate hands-on feel for the capabilities of the BS2p modules. This is especially handy when referring to the Philips I^2C components and Dallas Semiconductor 1-Wire components since the BS2p has special PBASIC commands to make interfacing very straightforward (ex. OWIN, OWOUT). A polled interrupt capability is also a key feature of the BS2p series. You'll get a BASIC Stamp 2p24/40 Demo Board, BASIC Stamp Manual, programming cable, components, pluggable wires, CD-ROM, and your choice of a BASIC Stamp 2p24 or a BASIC Stamp 2p40 module.

4. StampWorks Experiment Kit; #27297 - The StampWorks Experiment Kit includes the most tools compared to any other offering in our inventory of kits. The style of the book and the complexity of the code makes it perfect for advanced programmers that are able to grasp advanced level PBASIC coding. The progression of steps is as follows: discussion of new PBASIC elements/commands, Building the Circuit, Source Code presented, Behind the Scenes, and occasionally a Challenge. The kit includes a BASIC Stamp 2 module, StampWorks Manual (including 32 experiments with source code and support), NX-1000 Development Board, digital multimeter, programming cable, power supply, hand tools, Parallax CD-ROM (software and documentation), stepper motor, servo, and active and passive components. Designed and written by popular Nuts & Volts columnist Jon Williams.

Application Modules

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Parallax Application Modules (AppMods™) are handy little boards that provide additional functionality to your electronic and robotic projects. AppMods plug into the 2x10 header found on the Board of Education, BASIC Stamp Super Carrier Board, BS2p Demo Board, and the SumoBot and Toddler Boards. Each AppMod is shipped with documentation, example source code (if applicable), and a schematic. The packages also include hardware that makes it easy to stack and connect to our programming boards and to each other.

1. Audio Amplifier AppMod; #29143 - The BASIC Stamp microcontroller has two commands to generate sounds: DTMFOUT and FREQOUT. Make the most of these commands with this audio amplifier circuit board.

2. 2x8 LCD Terminal AppMod; #29121 - This low-cost 2x8 display is excellent for your smaller projects. Connects to any 2x10 AppMod header. Extensive documentation on the Parallax web site guides you through the programming interface.

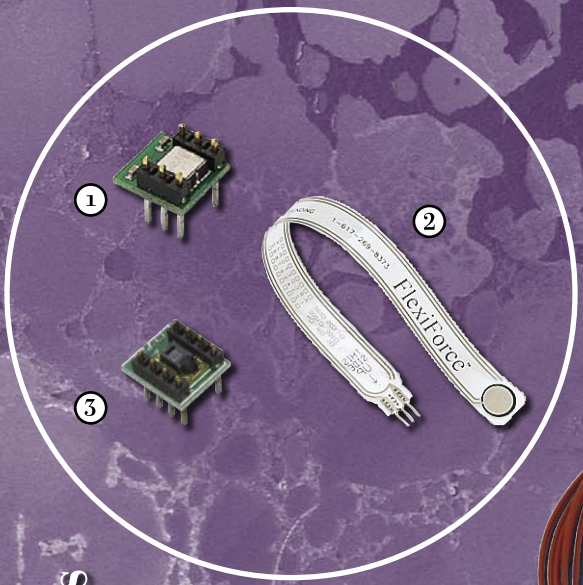
3. Compass Module AppMod; #29113 - The Compass AppMod is a low-cost, direct-interface direction sensor that is perfect for many applications, particularly with Boe-Bot robots. 8 directions are depicted with 4 LEDs. Ideal for robotic maze contests.

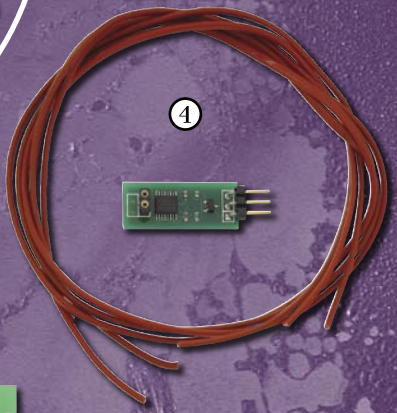
4. RS-232 DCE AppMod; #29120 - The RS-232 DCE AppMod allows you to add an additional, full-featured DCE serial port to BASIC Stamp and Javelin Stamp applications. Onboard sockets allow the selection of any available I/O pins for the serial connections. Unlike the BASIC Stamp module's programming port, all signals are completely separate (no hardware echo of received data) and the RS-232 DCE AppMod provides enough connections for implementing full hardware flow-control.

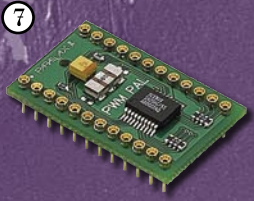
5. Stamp Modem AppMod; #29116 - The Stamp Modem provides a functional and easy-to-use modem interface to a BASIC Stamp application. The Stamp Modem is based on the Cermetek® Ch1786, an FCC part 68 pre-approved modem with a CCITT v.22 bis full AT command.

6. EmbeddedBlue Transceiver AppMod; #30068 - The EmbeddedBlue Transceiver AppMod provides standard Bluetooth® connectivity for BASIC Stamp applications without the need for detailed Bluetooth knowledge. Engineers, educators, hobbyisits, and OEMs can take advantage of advanced wireless connectivity with this easy-to-use module. The documentation includes a detailed overview and sample source code for EmbeddedBlue projects with the BASIC Stamp microcontroller, including interfacing to standard Bluetooth devices.

BASIC Stamp Accessories







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1. Memsic® 2125 Dual-Axis Accelerometer; #28017 - The Memsic 2125 is a low cost, dual-axis thermal accelerometer capable of measuring dynamic acceleration (vibration) and static acceleration (gravity) with a range of ±2 g. For integration into existing applications, the Memsic 2125 is electrically compatible with other popular accelerometers.

2. FlexiForce® Sensor Demo Kit; #30056 - The FlexiForce's active sensing area is a .375" diameter circle at the end of the sensor. The conductive leads are easy to connect to a breadboard or through-hole area. This sensor has an ideal output for A/D conversion - 0V is no force and 4.2V is 100 lbs. The kit includes a 220 ohm resistor, 0.1 uF and 0.01 uF capacitor, FlexiForce sensor, and printed documentation.

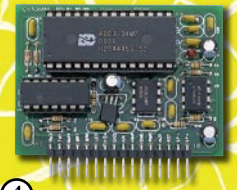
3. Sensirion Temperature/Humidity Sensor; #28018 - This is a smart sensor for both humidity and temperature, and it comes in a tiny package that incorporates the analog to digital interface. All your BASIC Stamp has to do is read out the humidity and temperature values through the two-wire digital serial interface. The only math required is a simple scale and offset. The sensor is calibrated so that it returns temperature with a resolution of 0.01° Celsius and relative humidity with a resolution of 0.03 percent.

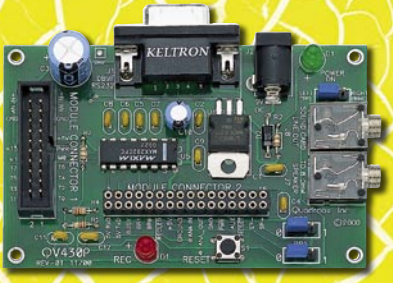
4. DS2760 Thermocouple Kit; #28022 - A low-cost, reliable means of measuring temperature over a wide range. The Dallas/Maxim DS2760 High Precision Li+ Battery Monitor is easily configured into an effective thermocouple interface. The DS2760 Thermocouple Module capitalizes on this application and provides a complete connection between the BASIC Stamp microcontroller and a standard thermocouple element.

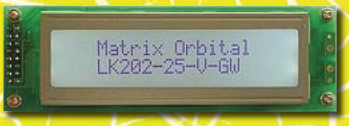
5. Red-i BASIC Stamp Web Server; #30005 - A fully-functional microcontroller-based web server and e-mail client. Has 10 Mbps 10-BaseT Ethernet connection and can serve up to 100 K bytes of webfiles (ex. htm, txt, zip, jpg).

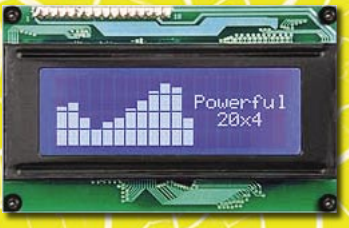
6. FlexiPanel™ Module; #30070 - Allows electronic products to create an operator interface on a range of remote devices including handhelds, mobile phones and other computers via a Bluetooth IrDA infrared link.

7. PWMPAL; #28020 - The PWMPAL is an intelligent peripheral that adds up to four PWM output channels and up to four control/counter input channels to the BASIC Stamp microcontroller. A BASIC Stamp module is required to use the PWMPAL and is available separately. The PWM channels can be configured to operate under software control, or under hardware control through the corresponding counter input channel. In addition to PWM waveform generation, the PWMPAL has four 16-bit counters that operate at all times, even when the counter pin is used for hardware PWM control.









Audio/Visual

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1. 2x16 Serial LCD; #27910 and
2. 2x16 Serial LCD - Backlit; #27923
These Seetron displays are the right choice if you require a small footprint and low current draw (2-3 mA without backlight). Commands allow scrolling, cursor positioning, and ASCII character support. Display has a 2400/9600 baud serial input and posts for connecting to +5V. ground, and I/O.

3. 120x32 Graphic LCD; #27936 - This LCD allows you to format the screen as 4 lines of 20 small characters or 2 lines of 10 large characters, or mix font sizes freely to achieve special effects. The graphics capabilities let you plot points, draw lines, and display full-screen pictures easily with a 4 KB non-volatile EEPROM.

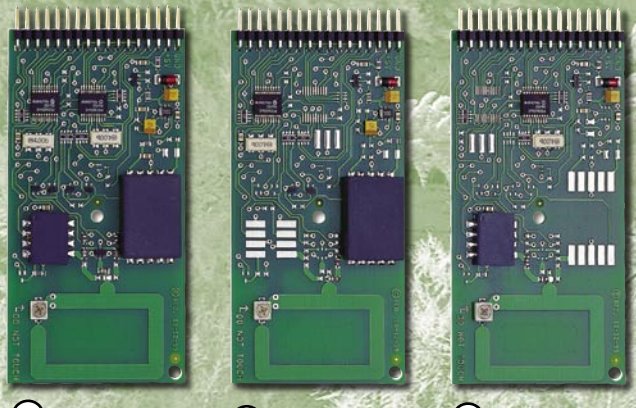
4. Quadravox QV306M4P Playback Module; #27967 - This device is pre-programmed with 240 sound files: numbers, measurements, days and technical terms. Playing any of these "files" is as simple as sending the file number from your BASIC Stamp module serially. A speaker is required (but not included) for playback.

5. Quadravox QV430P Sound Programmer; #27968 - If you are ready to play some Windows *.wav files from your QV306M4P (#27967), or if you want to put some additional words or files into the QV306M4P module you'll need the QV430 programmer. A mini-jack cable is required (but not included) to connect the QV430P to your PC's sound card headphone jack or speaker out jack as well as a mini-jack for your speaker.

6. 2x20 Serial LCD with Keypad Interface; #30057 and
7. 4x20 Serial LCD with Keypad Interface; #30058
Display text, horizontal and vertical bar graphs and large digits with the Matrix Orbital LCDs. They also allow for line wrapping, scrolling, contrast, backlight and time-out setting (up to 180 min). The display on the 4x20 LCD is a sharp inverse blue with white backlight. Both LCD modules have been pre-modified for BASIC Stamp compatibility (TTL level).

8. Emic Text-to-Speech SIP Module; #30006 - This SIP module will let your robot speak, provide a real human-console interface to your control system, or simply provide some entertainment to your BASIC Stamp microcontroller projects. Based on the Winbond® WTS701, this device intelligently handles values, sentences, numbers and common abbreviations with an extremely natural female voice with simple serial string sentences.

RF Modules



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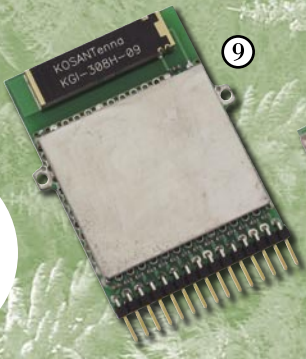

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1. 433 MHz SIP Dual-Mode RF Transceiver Module; #27988 and
2. 433 MHz SIP Dual-Mode RF Receiver Module; #27987 and
3. 433 MHz SIP Dual-Mode RF Transmitter Module; #27986

These wireless RF modules have a range of up to 250 feet. Modules include built-in antennas, encoders, decoders, and RF data processors for serial strings or switch on/off functions. Very simple to use, just plug it in then apply +5 V and your project is wireless, instantly. Single direction communication requires one of three combinations: (1) Transmitter and Receiver; (2) Transmitter and Transceiver; (3) Transceiver and Receiver. Please note: Bi-directional communication requires at least two Transceivers.

4. 418 MHz RF Receiver; #28004 and
5. Keychain RF Transmitter; #28005

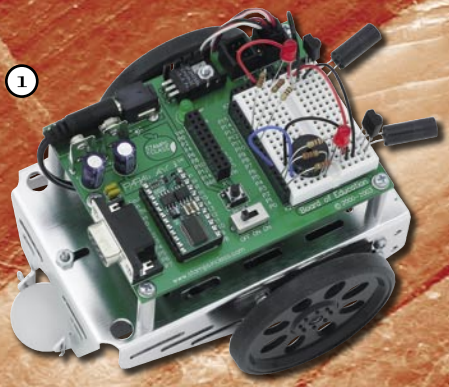
The 418 MHz receiver is a 7-pin module that plugs into your Parallax programming board (ex. Board of Education, NX-1000 Board). Transmission range is for this pair is 75 feet, and can send and receive up to five remote control commands. The keychain transmitter operates in switch mode - press a button on the keychain transmitter and the receiver pin goes "high."

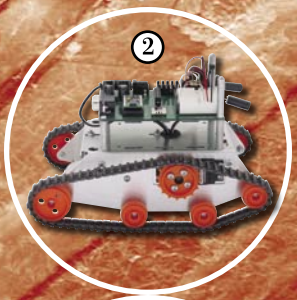
6. 433.92 MHz SIP/Solid Antenna RF Receiver Module; #27995 and
7. 433.92 MHz SIP/Solid Antenna RF Transceiver Module; #27997 and
8. 433.92 MHz SIP/Solid Antenna RF Transmitter Module; #27996

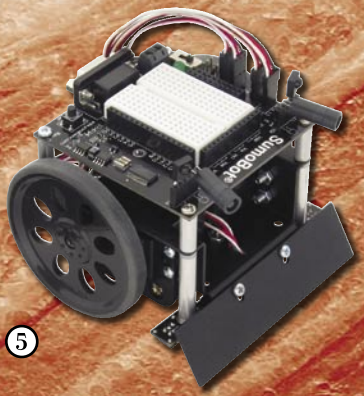
Low profile solid Antenna is only 2 inches long. Receiver transmission range is 150 feet. Use SERIN/SEROUT 2400 baud max. data rate. Single direction communication requires one of three combinations: (1) Transmitter and Receiver; (2) Transmitter and Transceiver; (3) Transceiver and Receiver. Please note: Bi-directional communication requires at least two Transceivers.

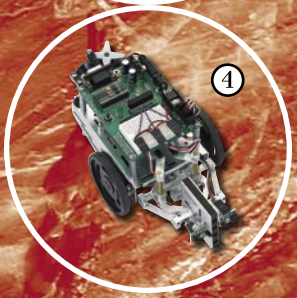
9. 900 MHz SureLink RF Transceiver; #30065 and
10. QuickLink Demo Board; #30066

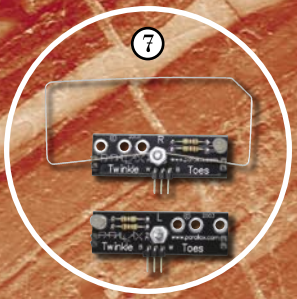
The SureLink module and the QuickLink Demo Board are designed to comply with FCC Part 15 Rules and Regulations. Since this module is a transceiver, you will need to have 2 SureLink Modules and 2 QuickLink Demo Boards (or your own boards) for bi-directional communication. For high quantity applications, the ultimate set up would include a customized PCB (your own Demo Board) designed to interface with the SureLink RF Modules. This RF pairing has Data DTE transfer rates of 1200 Baud to 115k Baud and RF Transfer rates from 48000 bps to 76.8 kbps with a range up to 1000 feet (dependent upon environment). The 12 page manual is available as a download at www.parallax.com. The documentation outlines 3 modes of operation (Demo Mode, Cable Link Mode, and Stand Alone Mode) which allows you to set the appropriate configuration for your application.











Robotics

1. Boe-Bot Robot Kit; #28132 - A perfect robot for beginners to experienced roboticists. The Boe-Bot is a Board of Education programming board and BS2-IC module mounted on a chassis with Parallax Continuous Rotation servos and wheels. Hardware, electronics, software, and complete step-by-step manual (*Robotics with the Boe-Bot*) are included.

2. Tank Tread Kit; #28106 - Turn your Boe-Bot robot into a Tank with this add-on kit. Simply remove the wheels from your Boe-Bot robot and attach the gears and tread to give your Boe-Bot robot the ability to traverse unfriendly terrain.

3. Crawler Kit; #30055 - Make your Boe-Bot robot a Crawler by adding on this accessory kit. Includes printed documentation with detailed assembly instructions. The Crawler runs on standard Boe-Bot source code.

4. The Gripper; #28200 - Pick up objects with the Gripper. It's a smart gripper with infrared sensors so you can program it to find and pick up objects that fit in its grasp. The Gripper is controlled by only one servo and is included with a complete printed manual and sample source code to get you started.

5. SumoBot® Robot Kit; #27400 - If you think one robot is interesting, wait until you see two of them battling for control Sumo-style. This little pusher will locate and knock its opponent right out of the ring while detecting the outside circle should an escape move be necessary. The electronics consists of a surface-mounted BASIC Stamp 2 module and infrared sensors to detect your opponent and the edge of the Sumo Ring. The hardware package includes the black anodized aluminum chassis and scoop, servo motors, wheels, 4AA power pack* mounting standoffs and screws. The included SumoBot Manual will take you from basic moves to one-on-one combat.

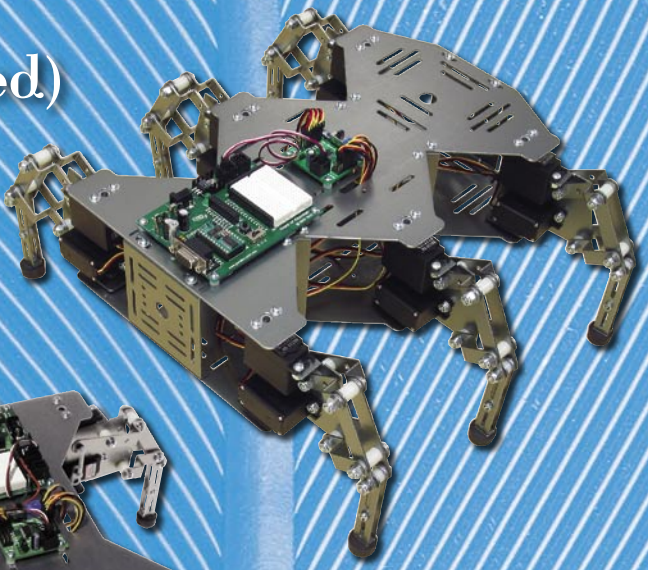
6. Toddler™ Robot Kit - Blue; #27311 -or- Gold; #27310 - The Toddler robot shifts its center of gravity to walk and turns by sliding its feet in opposite directions. The Toddler Robot Kit contains all hardware, electronics, software and a manual needed to build and program this walking robot. Because of the complexity of coordinating a walking robot (34 distinct movements) we consider the Toddler robot to be appropriate for ages 14+.

7. Toddler Bumper Sensors; #27312 - Chapter 8 of the *Advanced Robotics with the Toddler* text (included in the Toddler Robot Kit) uses these bumper sensors (also called "Twinkle Toes") for low-lying objects not seen by the infrared sensors. A creative design uses bi-color LEDs so green is active while the Toddler robot marches forward with red showing on the foot detecting an object.

Memsic 2125 Dual-Axis Accelerometer; #28017 (pictured page 12) - Chapter 9 of the *Advanced Robotics with the Toddler* text requires a Memsic Accelerometer (not included) to teach acceleration-based motion control.

*Batteries are not included in any of the robot kits.

Robotics (continued)



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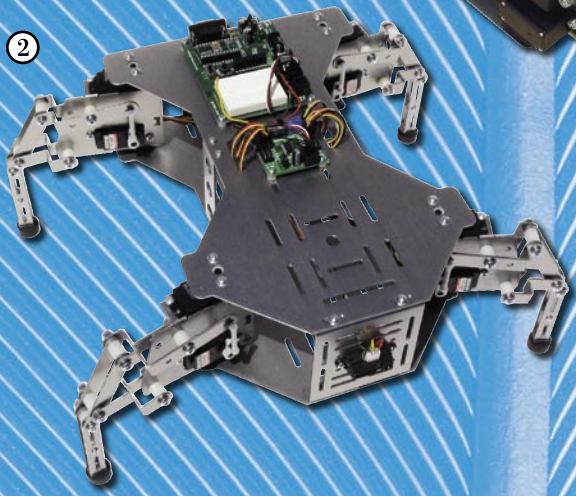
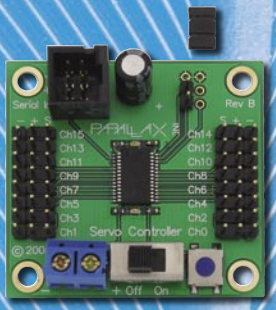


2

Motor Control



3

4

5

1. HexCrawler Kit*; #30063 - The HexCrawler is even better than ever with enhanced capabilities relating to both the body of this robot and the electronics as well. The HexCrawler robot is built on a high-quality aluminum chassis that provides a sleek platform for the 12 servo motors and BS2/BOE based control system. The kit allows you to get started with this impressive list of materials, including the BASIC Stamp 2 microcontroller, Board of Education carrier board, 12 Hitec servos, and 1 Parallax Servo Controller. Mounting holes and slots may be used to add custom robotics equipment. There's even a discussion group for HexCrawler/QuadCrawler enthusiasts. This forum is the best place for you to learn about what's new with these crawling autonomous robots.

2. QuadCrawler Kit*; #30073 - The QuadCrawler robot is built on a high-quality aluminum chassis that provides a sleek platform for the 8 servo motors and BS2/BOE based control system. The kit allows you to get started with this list of materials, including the BASIC Stamp 2 microcontroller, Board of Education carrier board, 8 Hitec servos, and 1 Parallax Servo Controller. Mounting holes and slots may be used to add custom robotics equipment. The QuadCrawler circuits are built on the Board of Education carrier board. The detailed manual gets you started with a number of complete programs. Once you have mastered the supplied code, you can easily customize it using your own programming creativity.

** The HexCrawler/QuadCrawler kit is not complete, since you are required to supply hand tools, a 6 cell battery pack, and a 9V battery.*

3. Parallax Servo Controller; #28023 - The Parallax Servo Controller (PSC) controls up to 16 servos, and may be networked together so that two PSC's can control 32 servos using a single I/O line. Luckily for you and your Parallax microcontroller, the PSC manages all of the servo pulses which enables your BASIC Stamp module or Javelin Stamp module to take care of more important aspects of the application. You will appreciate the value of this device and be able to enjoy several advanced features including: runtime selectable baud rate, servo ramping, position reporting, network readyness, enhanced resolution, and a serial command format.

4. Parallax Continuous Rotation Servo; #900-00008 - The Parallax Continuous Rotation servo is now made exclusively by Futaba®. Servos may be controlled directly from a BASIC Stamp I/O pin by using the PULSOUT command. Centering the servo is easy via the potentiometer adjustment port.

5. Parallax Standard Servo; #900-00005 - The Parallax servo is now made exclusively by Futaba. Servos may be controlled directly from a BASIC Stamp I/O pin by using the PULSOUT command.

Stamps In Class

Note: The Stamps In Class kits listed on this page (excluding *Advanced Robotics*) require a Board of Education programming board and BS2-IC in order to complete the experiments. Visit www.parallax.com/sic for our complete educational suite.

1. *What's a Microcontroller?* Parts and Text; #28152 - Our most popular introductory tutorial, *What's a Microcontroller?* is the best place to begin learning BASIC Stamp programming. The text is highly developed with over 40 hands-on activities and complete PBASIC 2.5 support. This tutorial is perfect for aspiring engiineers and hobbyists alike. This Parts and Text combo is included in the BASIC Stamp Discovery Kit (page 08).

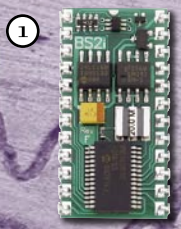
2. *Basic Analog and Digital* Parts and Text; #28155 - Teach yourself or your students the difference between analog resistance, capacitance, and frequency with simple circuits and the BASIC Stamp 2 microcontroller. After completing the projects presented in this text students will have a greater understanding of electronics that will aid them in the more advanced Stamps in Class tutorials.

3. *Robotics with the Boe-Bot* Parts and Text; #28132 - Build and program a BASIC Stamp-controlled robot that uses touch, light and infrared sensors to independently navigate in its environment. Easy to learn for beginners and easy to customize for experienced Roboticists, with many available accessories. Full kit is shown on page 18.

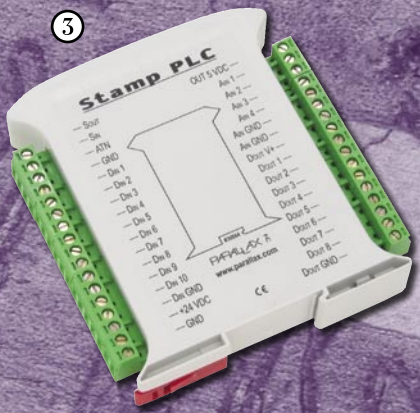
4. *Understanding Signals* Parts and Text; #28119 - *Understanding Signals* guide is an excellent kit to accompany the *Robotics with the Boe-Bot* and *What's a Microcontroller?* texts and may be completed concurrently or alone. A cost effective approach to learn about electrical signals readings with a USB digital oscilloscope, topics include pulse width modulation, serial communication, RC networks, and operational amplifiers.

5. *Applied Sensors* Parts and Text; #28153 - Collecting targeted information with a microcontroller is the core of this text. It is appropriate for environmental/science courses that want to incorporate technology into their program. Weather monitoring enthusiasts and those who want to learn more about serial communication will also find this text to be very valuable and engaging. Authored by Dr. Tracy Allen (www.emesystems.com), a well renowned scientist in the field of datalogging.

6. *Advanced Robotics with the Toddler* Parts and Text; Gold #27310 or Blue #27311
Build and program your own bipedal walking robot that can sense its environment and react with a variety of complex maneuvers. Have you or your students completed *Robotics with the Boe-Bot* and all of the included activities and projects? If so, *Advanced Robotics with the Toddler* is the next step. The activities in this text will teach your students to become versed in understanding dependencies between mechanical and electrical systems.


BS2i

Industrial


Stamp PLC
OUT 5 VDC
Sout
Sin
ATN
GND
Din 1
Din 2
Din 3
Din 4
Din 5
Din 6
Din 7
Din 8
Din 9
Din 10
Din GND
+24 VDC
GND
Ain 1
Ain 2
Ain 3
Ain 4
Ain GND
Ain GND
Dout V+
Dout 1
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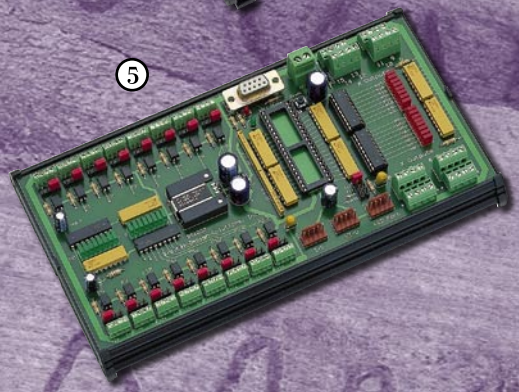
Dout 3
Dout 4
Dout 5
Dout 6
Dout 7
Dout 8
Dout GND
PARALLAX
www.parallax.com



1. BASIC Stamp 2 Industrial Module; #BS2I-IC - This is the industrial version of the BS2 and has the same specifications as the standard BASIC Stamp 2 (see pages 04) except for an extended temperature range of -40°C to +85°C (-40°F to +185°F).

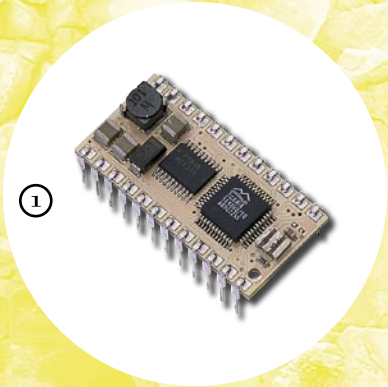
2. Stamp Controller Interface Board; #27945 - The Stamp Controller Interface allows the BASIC Stamp microcontroller to connect directly to industrial type digital I/O control boards produced by Opto22, Grayhill™, Allen-Bradley™, and others that accept 0-5 VDC voltage control levels. These optically isolated modules are ideal for interfacing microcontrollers to the real world, and are more reliable by providing proper isolation. The Stamp Controller Interface accepts all BASIC Stamp modules and has a parallel port connection for monitoring status of I/O pins. A 9-12 VDC, 2.1 mm jack is included for external power supply (sold separately). A clever driver/resistor configuration allows the user to mix and match up to 16 inputs and outputs in any configuration.

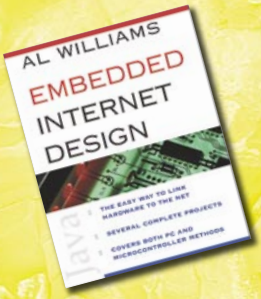
3. Stamp PLC; #30064 - The Stamp PLC (Program Logic Controller) is sized for automating small machines. Specified by Parallax and designed by Lawicel HB of Sweden, this product represents our combined expertise to answer a frequent request from our customers. A 24-pin BASIC Stamp module or Javelin Stamp module is required and sold separately. PLCs are microcontrollers that are packaged to withstand the hazards of an industrial environment. Our Stamp PLC inputs and outputs are optically isolated, fully protected, and the electronics are electrically tough and rather immune to noise typically present in industrial environments. Stamp PLC is housed by a strong and sleek enclosure that offers an integral DIN rail mount. Unlike other PLC's which may have proprietary code, you may create the code for your Stamp PLC and customize it to fit your needs. This non-restrictive power will allow you to design and modify your systems much faster.

4. 16 I/O Relay Board 24 V; #27965 - The BS2 16-relay Industrial I/O Board was designed for use in industrial machinery as a main controller, or as a controller to add features to a machine. Standard 24-volt DC power is used for both for input sensor and output load devices. This board will support all BS2 24-pin BASIC Stamp modules such as the BS2, BS2e, BS2sx, and the BS2p24. This board may be used to control industrial processes, or equipment functions, without having to learn ladder logic.

5. 32 I/O Relay Board 24 V; #27966 - The BSIO32ex module was designed for use in industrial machinery as a main controller, or as a controller to add features to a machine. Standard 24-volt DC power is used for both for input sensor and output load devices. This board will support only the BASIC Stamp 2p40. This board may be used to control industrial processes or equipment functions without having to learn ladder logic.

Javelin Stamp Tools





1. Javelin Stamp Module; #JS1-IC - The Javelin Stamp module is a 24-pin DIP module programmed in a subset of the Sun Microsystems Java® language. The Javelin Stamp module has: 32 k bytes of RAM/program space (leftover space can be used for variables, arrays, and serial buffers); 32 k bytes of non-volatile EEPROM; buffered serial communication in the background; up to seven UART objects that can communicated independently of each other and the main program; pulse width modulation in the background; 8000 instructions/second execution speed. The Javelin Stamp module is compatible with any BASIC Stamp programming board with a 24-pin DIP socket.

2. Javelin Stamp Starter Kit; #27237 - Begin your quest for Java programming success! All items shown above are included in this Starter Kit (7.5 VDC 1 amp power supply, not included). The Javelin Stamp Demo Board is only available with the kit and it has duplex RS232 UART and servo port connections.

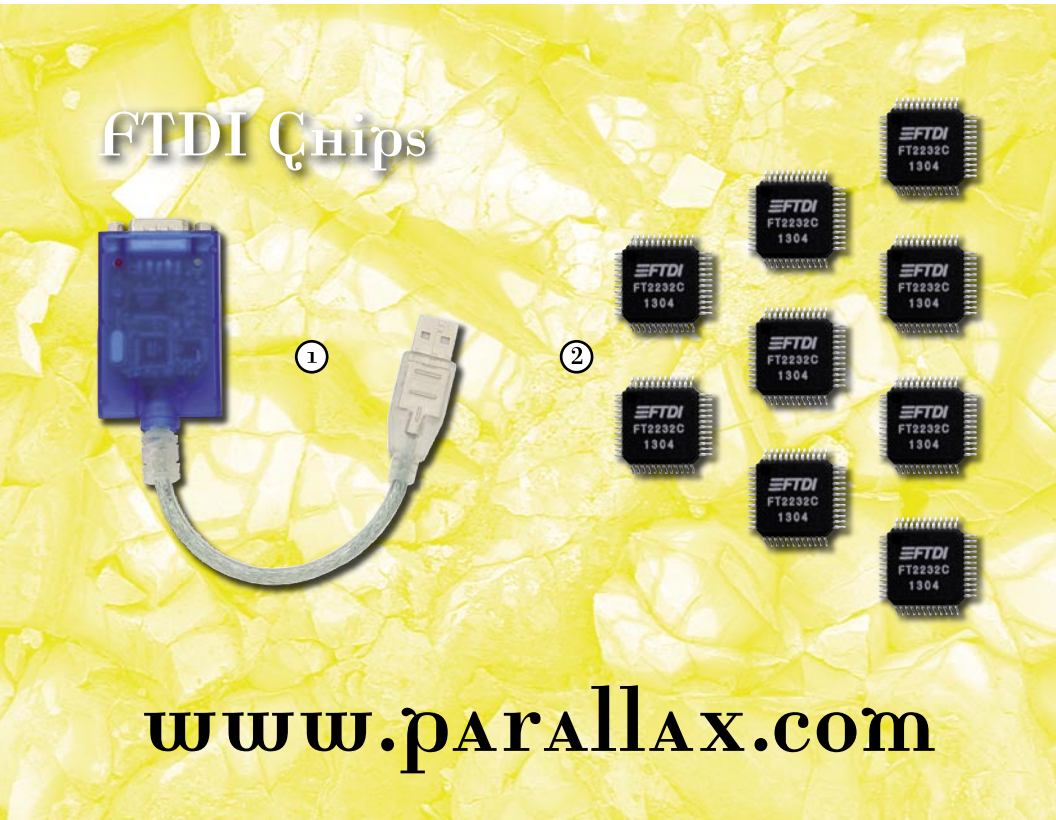
***3. Embedded Internet Designs*; #70007**
This book contains under-the-hood net explanations, complete coverage of the Javelin Stamp module and TINI® microcontroller, dozens of source code listings, and the best short course there is in hooking devices to the net. Al Williams's guide takes you beyond internet-integrated phones and TV set-top boxes to the internet-connected future of all kinds of appliances, entire homes, factories, and even automobiles.

1. FTDI US232B USB-to-Serial Adapter; #800-00030 - FTDI has demonstrated that they can provide fully functional drivers, maintaining and improving them as operating systems change (such as Windows). If you don't have a serial port on your machine, this is an easy solution. To use this adapter, simply plug it in to your machine's USB port. Next, point the operating system to the appropriate driver. Then, add the driver port to your Parallax BASIC Stamp module, Javelin Stamp module, or SX-Key software IDE and you're ready to program with a virtual COM port.

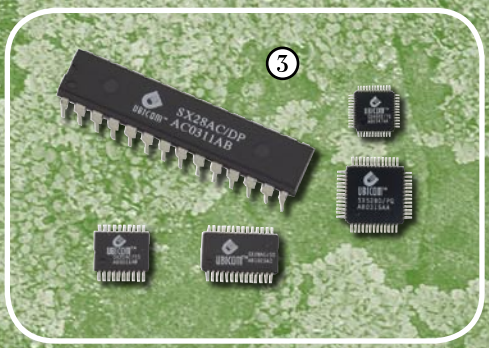
2. FTDI Chips

Parallax stocks the most common FTDI devices in production quantities; others are stocked in prototype quantities. Volume pricing for all parts up to 10,000 units is available at www.parallax.com. Our distributors may procure the FTDI chips through special orders. Check www.parallax.com for our complete selection of FTDI chips.

FTDI Chip	Parallax Part#	Description
FT232BM	#604-00031	USB to serial TTL-level UART up to 3 MBit/s.
FT245BM	#604-00032	USB to parallel FIFO up to 1 Mbyte/s.
FT2232C	#604-00033	Dual-channel configurable FT232BM or FT245BM with multi-protocol synchronous serial engine (for SPI, JTAG, etc) with data rates up to 5.6 Mbit/s.



SX-Key Tools and Chips



Are you ready to take the step from PBASIC programming to Assembly? Try the SX line of tools and chips. Visit www.parallax.com/sx for a more complete listing of SX tools and chip availability. Note: A 7.5 V, 1000 mA DC supply (#750-00009) is recommended for use with the SX Tech Tool Kits.

1. SX Tech Tool Kit LITE; #45180 - The popular SX Tech Tool Kit LITE with the SX-Key Manual v2.0 is an excellent starting point to get you developing SX projects with Parallax's SX-Key® programming tool. Upon receiving the kit, you will be able to program SX chips within the hour. Kit includes: SX-Key Rev F, SX Tech Board, (2) SX 28AC/DP 50 MIPS chips, (1) Murata 50 MHz resonator, (1) Murata 4 MHz resonator, SX-Key Manual v2.0, CD ROM (software, PDF SX-Key Manual), 4-pin header, and a Serial Cable. A 7.5 VDC power supply is not included. *Note: we recommend that our international customers order this kit to reduce shipping costs.*

2. SX Tech Tool Kit PLUS; #45181 - This kit is the most complete SX-Key programming tool package offered by Parallax, and the most complete starting point with everything you'll need except for a 7.5 VDC power supply. This kit includes all the contents of the SX Tech Tool Kit LITE plus 2 extra books: *Programming the SX Micontroller a Complete Guide* by Gunther Daübach, and *Beginning Assembly Language for the SX Microcontroller* by Al Williams.

Parallax has been appointed the Master Distributor for the Ubicom SX microcontroller. This means Parallax and our distributors will:

- Provide very low-cost SX-Key programming tools
- Increase our technical service, sales support and distribution for the SX
- Provide low-cost SX chips with hassle-free, on-line or traditional ordering
- Stock production quantities of all SX chip packages for immediate delivery with no lead time
- Develop university program support
- Ensure a long-term, reliable supply for our customers

3. SX Chip Overview

Part #	Pins	I/O	EE/Flash	RAM
SX20AC/SS	20	12	2K bytes	137 bytes
SX28AC/DP	28	20	2K bytes	136 bytes
SX28AC/SS	28	20	2K bytes	136 bytes
SX48BD	48	36	4k x 12 words	262 bytes
SX52BD	52	40	4k x 12 words	262 bytes

Altera FPGA Development Tools

The Stratix™ and Cyclone™ SmartPacks and FastPack make it easy for you to explore powerful FPGAs from Altera®. FPGAs are reconfigurable logic chips which contain many thousands of gates. If you've ever wanted to break beyond the constraints imposed by microcontrollers and make your own systems instead, this is what you need. These FPGA boards are for advanced customers and are not related to the BASIC Stamp microcontroller line of products.

1. Stratix SmartPack with EP1S10; #60002 and
2. Stratix SmartPack with EP1S25; #60001

The SmartPacks are based on the Stratix chip from Altera. The Stratix has scalable RAMs, DSP blocks, and PLLs, all meshed in an enhanced logic fabric. And it's FAST - built in a 0.13m all-copper process, the RAMs are rated for 300 MHz operation. The PLLs will step up nominal input frequencies to 400+ MHz. The SmartPack board hosts a Stratix EP1S10/EP1S25 device, power supplies, loader/non-volatile booter, clock, 128 I/Os, filtering for all 6 PLLs, a reset button, and 8 LEDs. The SmartPack EP1S10 comes with Altera's Quartus II® Web Edition software. Note: The EP1S25 device requires Quartus II Full Edition from Altera (www.altera.com).

Stratix Device Overview	EP1S10	EP1S25
Logic Elements	10,570	25,660
M512 RAM Blocks	94	224
M4K RAM Blocks	60	138
M512K RAM Blocks	1	2
DSP Blocks	6	10
PLLs	6	6

3. Cyclone SmartPack with EP1C20; #60003 and
4. Cyclone FastPack with EP1C3; #60004

The Cyclone is a cost-reduced version of the Stratix. Built in the same technology, the Cyclone is similar to the Stratix, but lacks the 512kb RAMs and DSP blocks. The Cyclone Family may be programmed in AHDL, Verilog, or VHDL.

Cyclone FPGA Overview	EP1C20	EP1C3
Logic Elements	20,060	2,910
M4K RAM Blocks	64	13
Total RAM Bits	294,912	59,904
PLLs	2	1
Maximum User I/O Pins	301	104

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