BeeProg+

Extremely fast universal **USB**/LPT interfaced programmer.

Short description:

- **32411** supported devices by 2.39a version of SW (15. Jun. 2007)
- **extremely fast programming**, one of the fastest programmers in this category. Programs 64-Mbit NOR Flash memory less than 50 seconds and **1Gbit NAND Flash less than 220 sec.**
- 48-pins powerful pindrivers, no adapter required for any DIL devices
- connector for **in-circuit programming** (ISP)
- dual connection to PC: USB (up to 480 Mbit/s) or parallel (printer) port
- **USB** USB 2.0 (high speed, full speed) and 1.1 compatible interface
- alternatively high-speed **IEEE 1284** (ECP/EPP) printer-port (LPT) interface
- comfortable and easy to use control program, **Windows 98/Me/NT/2000/XP/2003/XPx64/Vista** compatible
- **Multiprogramming** possible by attaching more programmers to one PC
- meet **CE** requirements
- **warranty - 3 years**

Optional accessories:

- socket converters
- connection cable PC-programmer, LPT port

Features

GENERAL

- Next generation of USB/LPT-compatible, Windows 98/ME/NT/2000/XP/2003/XPx64/Vista based ELNEC **universal programmers**, built to meet the strong demand of the small manufacturing and developers community for the fast and reliable universal programmer.
- Supports **all kinds** of types and silicon technologies of today and tomorrow **programmable devices** without family-specific module. You have freedom to choose the optimal device for your design. Using built-in in-circuit serial programming (**ISP**) connector, the programmer is able to program ISP capable chips in circuit.
- BeeProg+ isn't only a programmer, but also a **tester** of TTL/CMOS logic ICs and memories. Furthermore, it allows generation of user-definable **test pattern sequences**.
- Provides very competitive price coupled with excellent hardware design for reliable programming. Probably **best "value for money"**programmer in this class.

- **Very fast programming** due to high-speed FPGA driven hardware and execution of time-critical routines inside of the programmer. At least fast than competitors in this category, for many chips much faster than most competitors. As a result, when used in production this one-socket-programmer waits for an operator, and not the other way round.
- BeeProg+ interfaces with the IBM PC compatible or higher, portable or desktop personal computers through **USB** (2.0/1.1) port or any **standard parallel (printer) port**. Programmer can utilize power of both USB high-speed port and IEEE1284 (ECP/EPP) high-speed parallel port. Support of both USB/LPT port connection gives you the choice to connect the BeeProg+ programmer to any PC, from latest notebook to older desktop without USB port.

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HARDWARE

- **FPGA based** totally reconfigurable 48 **powerful TTL pindrivers** provide H/L/pull_up/pull_down and read capability for each pin of socket. Advanced pindrivers incorporate **high-quality high-speed** circuitry to deliver signals without overshoot or ground bounce for all supported devices. Improved pin drivers drivers operate down to 1.8V so you'll be ready to program the full range of today's advanced low-voltage devices.
- The programmer performs device **insertion test** (wrong or backward position) and **contact check** (poor contact pin-to-socket) before it programs each device. These capabilities, supported by **overcurrent protection** and **signature-byte check** help prevent chip damage due to operator error.
- The selftest capability allow to run diagnostic part of software to thoroughly check the health of the programmer.
- Built-in **protection circuits** eliminate damage of programmer and/or programmed device due to environment or operator failure. All the inputs of the BeeProg+ programmer, including the ZIF socket, connection to PC and power supply input, are **protected against ESD** up to 15kV.
- BeeProg+ programmer performs programming **verification** at the **marginal level** of supply voltage, which, obviously, improves programming yield, and guarantees long data retention.
- Various **socket converters** are available to handle device in PLCC, SOIC, PSOP, SSOP, TSOP, TSSOP, TQFP, QFN (MLF), SDIP, BGA and other packages.

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SOFTWARE

- Programmer is driven by an **easy-to-use** control program with pull-down menu, hot keys and on-line help. Selecting of device is performed by its class, by manufacturer or simply by typing a fragment of vendor name and/or part number.
- **Standard** device-related commands (read, blank check, program, verify, erase) are boosted by some **test functions** (insertion test, signature-byte check), and some **special functions** (autoincrement, production mode - start immediately after insertion of chip into socket).
- All known data formats are supported. Automatic file format detection and conversion during loading of file.
- The rich-featured **auto-increment function** enables one to assign individual serial numbers to each programmed device - or simply increments a serial number, or the

function enables one to read serial numbers or any programmed device identification signatures from a file.

- The software also provide a many information about programmed device. As a special, the **drawing of all available packages** are provided. The software provide also **explanation of chip labelling** (the meaning of prefixes and suffixes at the chips) for each supported chip.
- The software provide a full information for ISP implementation: Description of ISP connector pins for currently selected chip, recommended target design around in-circuit programmed chip and other necessary information.
- The **remote control** feature allows to be PG4UW software flow controlled by other application – either using .BAT file commands or using DLL file. DLL file, examples (C/PAS/VBASIC/.NET) and manual are part of standard software delivery.
- **Jam files** of JEDEC standard JESD-71 are interpreted by **Jam Player**. Jam files are generated by design software which is provided by manufacturer of respective programmable device. Chips are programmer in-ZIF or through ISP connector (IEEE 1149.1 Joint Test Action Group (JTAG) interface).
- **VME files** are interpreted by VME Player. VME file is a compressed binary variation of SVF file and contains high-level IEEE 1149.1 bus operations. VME files are generated by design software which is provided by manufacturer of respective programmable device. Chips are programmer in-ZIF or through ISP connector (IEEE 1149.1 Joint Test Action Group (JTAG) interface).
- Multiple devices are possible to program and test via JTAG chain: JTAG chain (ISP-Jam) or JTAG chain (ISP-VME).
- Attaching of more BeeProg+ programmers to the same PC (through USB port) is achieved a **powerful multiprogramming system**, which **support as many chips, as are supported by BeeProg+ programmer** and without obvious decreasing of **programming speed**. It is important to know, there is a concurrent multiprogramming - each programmer works independently and each programmer can program different chip, if necessary.

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CARE FOR THE CUSTOMERS

- It is important to remember, that a support of most of the new devices requires **only a software update**, because the BeeProg+ is truly a universal programmer. With our prompt service you can have new device added to the list of supported devices within hours! See AlgOR (Algorithm On Request) service for details.
- **Free software updates** are available by download from our WEB site.
- **Keep-Current and AlgOR services, our next step towards customer satisfaction.**
  - Keep-Current service means, that ELNEC ships the latest version of programmer software and updated user documentation (Keep-Current package) to customer . The Keep-Current service is your hassle-free guarantee that you achieving the highest quality programming on ELNEC programmers, at minimal cost.
  - AlgOR (Algorithm On Request) service gives the user a tool to influence amount and types of programmed devices as needed.
- Advanced design of the BeeProg+ programmer, including protective circuits, original brand components, and careful manufacturing and burning allows us to provide a **three-year warranty** on parts and labor for the programmer (limited 25 000-cycle warranty on ZIF sockets).
- Online technical support (WebForm/e-mail based) is available within promised 24 hours time limit.

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Specification

HARDWARE

Base unit, DACs

- USB 2.0 high-spped compatible port, up to 480 Mbit/s transfer rate
- FPGA based IEEE 1284 slave printer port, up to 1MB/s transfer rate
- on-board intelligence: powerful microprocessor and FPGA based state machine
- three D/A converters for VCCP, VPP1, and VPP2, controllable rise and fall time
- VCCP range 0..8V/1A
- VPP1, VPP2 range 0..26V/1A
- autocalibration
- selftest capability
- protection against surge and ESD on power supply input, parallel port connection
- banana jack for ESD wrist straps connection
- banana jack for connection to ground

ZIF socket, pindriver

- 48-pin DIL ZIF (Zero Insertion Force) socket accepts both 300/600 mil devices up to 48-pin
- pindrivers: 48 universal
- VCCP/VPP1/VPP2 can be connected to each pin
- perfect ground for each pin
- FPGA based TTL driver provides H, L, CLK, pull-up, pull-down on all pindriver pins
- analog pindriver output level selectable from 1.8 V up to 26V
- current limitation, overcurrent shutdown, power failure shutdown
- ESD protection on each pin of socket (IEC1000-4-2: 15kV air, 8kV contact)
- continuity test: each pin is tested before every programming operation

ISP connector

- 20-pin male type with missinsertion lock
- 6 TTL pindrivers, provides H, L, CLK, pull-up, pull-down; level H selectable from 1.8V up to 5V to handle all (low-voltage including) devices.
- 1x VCCP voltage (range 2V..7V/100mA), can be applied to two pins
- programmed chip voltage (VCCP) with both source/sink capability and voltage sense
- 1x VPP voltage (range 2V..25V/50mA), can be applied to six pins
- target system supply voltage (range 2V..6V/250mA)
- ESD protection on each pin of ISP connector (IEC1000-4-2: 15kV air, 8kV contact)
- two output signals, which indicate state of work result = LED OK and LED Error (active level: min 1.8V)
- input signal, switch YES! equivalent (active level: max 0.8V)

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DEVICE SUPPORT

Programmer, in ZIF socket

- EPROM: NMOS/CMOS, 2708*, 27xxx and 27Cxxx series, with 8/16 bit data width, full support for LV series
- EEPROM: NMOS/CMOS, 28xxx, 28Cxxx, 27EExxx series, with 8/16 bit data width
- Flash EPROM: 28Fxxx, 29Cxxx, 29Fxxx, 29BVxxx, 29LVxxx, 29Wxxx, 49Fxxx series, from 256Kbit to 1Gbit, with 8/16 bit data width, full support for LV series
- Serial E(E)PROM: 24Cxxx, 24Fxxx, 25Cxxx, 45Dxxx, 59Cxxx, 25Fxxx, 25Pxxx, 85xxx, 93Cxxx, NVM3060, MDAxxx series, full support for LV series
- Configuration (EE)PROM: XCFxxx, XC17xxxx, XC18Vxxx, EPCxxx, AT17xxx, 37LVxx
- 1-Wire E(E)PROM: DS1xxx, DS2xxx
- PROM: AMD, Harris, National, Philips/Signetics, Tesla, TI
- NV RAM: Dallas DSxxx, SGS/Inmos MKxxx, SIMTEK STKxxx, XICOR 2xxx, ZMD U63x series
- PLD: Altera: MAX 3000A, MAX 7000A, MAX 7000B, MAX 7000S, MAX7000AE, MAX II
- PLD: Lattice: ispGAL22V10x, ispLSI1xxx, ispLSI1xxxEA, ispLSI2xxx, ispLSI2xxxA, ispLSI2xxxE, ispLSI2xxxV, ispLSI2xxxVE, ispLSI2xxxVL, LC4xxxB/C/V/ZC, M4-xx/xx, M4A3-xx/xx, M4A5-xx/xx, M4LV-xx/xx
- PLD: Xilinx: XC9500, XC9500XL, XC9500XV, CoolRunner XPLA3, CoolRunner-II
- other PLD: SPLD/CPLD series: AMI, Atmel, AMD-Vantis, Gould, Cypress, ICT, Lattice, NS, Philips, STM, VLSI, TI
- Microcontrollers 48 series: 87x41, 87x42, 87x48, 87x49, 87x50 series
- Microcontrollers 51 series: 87xx, 87Cxxx, 87LVxx, 89Cxxx, 89Sxxx, 89LVxxx, all manufacturers, Philips LPC series
- Microcontrollers Intel 196 series: 87C196 KB/KC/KD/KT/KR/...
- Microcontrollers Atmel AVR: AT90Sxxxx, ATtiny, ATmega series
- Microcontrollers Cypress: CY7Cxxxxx, CY8Cxxxxx
- Microcontrollers ELAN: EM78Pxxx
- Microcontrollers MDT 1xxx and 2xxx series
- Microcontrollers Microchip PICmicro: PIC10xxx, PIC12xxx, PIC16xxx, PIC17Cxxx, PIC18xxx, PIC24xxx, dsPIC series
- Microcontrollers Motorola (Freescale): 68HC05, 68HC08, 68HC11, HCS08, HCS12 series
- Microcontrollers Myson MTV2xx, 3xx, 4xx and 5xx series
- Microcontrollers National: COP8xxx series
- Microcontrollers NEC: uPD78Fxxx series
- Microcontrollers Novatek: NT68xxx series
- Microcontrollers Scenix (Ubicom): SXxxx series
- Microcontrollers SGS-Thomson: ST6xx, ST7xx, ST10xx, STR7xx series
- Microcontrollers TI: MSP430 and MSC121x series
- Microcontrollers ZILOG: Z86/Z89xxx and Z8xxx series
- Microcontrollers other: EM Microelectronic, Fujitsu, Goal Semiconductor, Hitachi, Holtek, Princeton, Macronix, Winbond, Infineon(Siemens), Samsung, Toshiba, ...

Programmer, through ISP connector

- Serial E(E)PROM: IIC series, MW series, SPI series, KEELOQ series, serial data Flash, PLD configuration memories
- Microcontrollers Atmel: AT89Sxxx, AT90Sxxxx, ATtiny, ATmega series
- Microcontrollers Cypress: CY8C2xxxx
- Microcontrollers Elan: EM78Pxxx, EM6xxx series
- Microcontrollers EM Microelectronic: 4 and 8 bit series

- Microcontrollers Microchip PICmicro: PIC10xxx, PIC12xxx, PIC16xxx, PIC17xxx, PIC18xxx, PIC24xxx, dsPIC series
- Microcontrollers Motorola/Freescale: HC11 series, HC908 series (both 5-wire, All-wire), HCS08, HCS12
- Microcontrollers NEC: uPD7xxx series
- Microcontrollers Philips: LPC2xxx series, LPC series, 89xxx series
- Microcontrollers Scenix (Ubicom): SXxxx series
- Microcontrollers TI: MSP430 (both JTAG and BSL series), MSC12xxx series
- PLD: Lattice: ispGAL22xV10x, ispLSI1xxxEA, ispLSI2xxxE, ispLSI2xxxV, ispLSI2xxxVE, ispLSI2xxxVL, M4-xx/xx, M4LV-xx/xx, M4A3-xx/xx, M4A5-xx/xx, LC4xxxB/C/V/ZC
- Various PLD (also by JAM player/JTAG support):
  Altera: MAX 3000A, MAX 7000A, MAX 7000B, MAX 7000S, MAX 9000, MAX II
  Xilinx: XC9500, XC9500XL, XC9500XV, CoolRunner XPLA3, CoolRunner-II

Notes:

- *devices marked * are obsolete, programming with additional module*
- *for all supported devices see actual DEVICE LIST*

I.C. Tester

- TTL type: 54,74 S/LS/ALS/H/HC/HCT series
- CMOS type: 4000, 4500 series
- Static RAM: 6116 .. 624000
- User definable test pattern generation

Package support

- support all devices in DIP with default socket
- package support includes DIP, SDIP, PLCC, JLCC, SOIC, SOP, PSOP, SSOP, TSOP, TSOPII, TSSOP, QFP, PQFP, TQFP, VQFP, QFN (MLF), SON, BGA, EBGA, FBGA, VFBGA, UBGA, FTBGA, LAP, CSP, SCSP etc.
- support devices in non-DIP packages up to 48 pins with universal adapters
- programmer is compatible with third-party adapters for non-DIP support

Programming speed

Notes:

- *It is important to know, we always use random numbers pattern for programming speed testing. Some our competitors use "sparse" pattern, where only few non-blank data are programmed or are there are used data with only few 0 bits (FE, EF, etc.). This cheating approach can "decrease" programming time considerable. If you plan to compare, ask always which pattern they use.*
- *The programming speed depends on PC speed only slightly.*
- *If the programmer attached to PC through LPT port, the programming might take longer.*

Device	Size [bits]	Operation	Time
M50FW080 (parallel Flash)	100000Hx8 (8 Mega)	programming and	22 sec.

		verify	
MX28F640C3BT (parallel Flash)	400000Hx16 (64 Mega)	programming and verify	57 sec.
K9F1G08U0M (parallel NAND Flash)	8400000Hx8 (1 Giga)	programming and verify	239 sec.
AT45D081 (serial Flash)	108000Hx8 (16 Mega)	programming and verify	36 sec.
AT89C51RD2 (microcontroller)	10000Hx8	programming and verify	15 sec.
PIC18LF452 (microcontroller)	4000Hx16	programming and verify	4 sec.

Conditions: *PC Pentium 4, 2.4 GHz, 512 MB RAM, USB 2.0 HS, Windows XP.*

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SOFTWARE

- **Algorithms:** only manufacturer approved or certified algorithms are used. Custom algorithms are available at additional cost.
- **Algorithm updates:** software updates are available regulary, approx. every 4 weeks, free of charge. **OnDemand** version of software is available for highly needed chips support and/or bugs fixes. Available nearly daily.
- **Main features:** revision history, session logging, on-line help, device and algorithm information.

Device operations

- **standard:**
  - intelligent device selection by device type, manufacturer or typed fragment of part name
  - automatic ID-based selection of EPROM/Flash EPROM
  - blank check, read, verify
  - program
  - erase
  - configuration and security bit program
  - illegal bit test
  - checksum
  - interprete the Jam Standard Test and Programming Language (STAPL), JEDEC standard JESD-71
  - interprete the VME files compressed binary variation of SVF files
- **security**
  - insertion test, reverse insertion check
  - contact check
  - ID byte check
- **special**
  - production mode (automatic start immediately after device insertion)
  - lot of serialization modes (more type of incremental modes, from-file mode, custom generator mode)
  - statistic
  - count-down mode

Buffer operations

- view/edit, find/replace
- fill/copy, move, byte swap, word/dword split
- checksum (byte, word)
- print

File load/save

- no download time because programmer is PC controlled
- automatic file type identification/recognition
  Supported file formats
  - unformatted (raw) binary
  - HEX: Intel, Intel EXT, Motorola S-record, MOS, Exormax, Tektronix, ASCII-SPACE-HEX,, ASCII HEX
  - Altera POF, JEDEC (ver. 3.0.A), eg. from ABEL, CUPL, PALASM, TANGO PLD, OrCAD PLD, PLD Designer ISDATA, etc.
  - JAM (JEDEC STAPL Format), JBC (Jam STAPL Byte Code), STAPL (STAPL File) JEDEC standard JESD-71
  - VME (ispVME file VME2.0/VME3.0)

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GENERAL

PC system requirements

- Common, software related requirements
- Programmer hardware related requirements:
  - either one USB port, 2.0 compatible
  - or one (parallel) printer port with nothing attached, the IEEE 1284 compatible printer port (ECP/EPP) on PCI bus recommended

Operation

- operating voltage 110-250V AC
- power consumption max. 20W active, about 2W sleep
- dimensions 195x140x55 mm (7.7x5.5x2.2 inch)
- weight 0.9kg (1.98 lb)
- temperature 5°C ÷ 40°C (41°F ÷ 104°F)
- humidity 20%..80%, non condensing

Package includes

- BeeProg+ programmer
- power cord
- connection cable PC-programmer, USB port
- ISP cable
- diagnostic POD for selftest of the programmer
- diagnostic POD for ISP connector - for selftest of the ISP connector
- anti-dust cover for ZIF socket
- user manual

- software
- registration card
- calibration test report
- transport case

Additional services

- Keep Current - ELNEC sends to user the latest version of programmer software and updated user documentation (Keep-Current package)
- AlgOR (Algorithms On Request) - add new supported devices on customer request

Programmer price also includes

- free technical support (hot line)
- free life-time software update via Internet