



864



Introduction

864 is a universal **programmer** that supports programmable integrated circuits or devices manufactured in various technologies. Powerful internal pin-driver electronics controls logic levels, pull-up/pull-down, clock, ground, one power supply and two programming supplies and is able to read all 48 pins independently. This advanced design gives 864 the ability to handle almost every programmable device in DIL package up to 48 pins without any adapters and/or family modules. This design philosophy allows B+K PRECISION to easily add new devices to the device list, giving you the freedom to implement the optimum device in your designs.

864 is also a **tester** of TTL/CMOS logic circuits and various memories. Furthermore, it can generate user-definable **test pattern sequences**. 864 is a true universal and a true low-cost programmer, providing the best "value for money" in today's market.

864 works with the IBM PC Pentium compatible or higher, portable or desktop personal computers. No special interface card is required to connect to the PC since 864 uses the **standard parallel printer port**. The 864 control program also supports bi-directional protocols for the parallel connection to the PC printer port providing fast and reliable **communication speed**.

The programmer has on-board intelligence and is controlled by powerful Microcontroller system and support devices. 864 has been designed for **multitasking operating systems** and is able to perform time-critical programming sequences independently of the PC operating system status and without being interrupted by any other parallel process running on the PC. Consequently, 864 works without any problem on systems running Windows 95/98/Me/NT/2000/XP.

864 performs **device insertion test** (wrong or backward position) and contact check (poor contact pin-to-socket) before it programs any device. These capabilities, supported by current limit protection and signature-byte check, help prevent chip damage due to operator error.

Built-in protection circuits help prevent damage of the target device due to mains supply fluctuations, communication errors or if the PC operating system fails. In the event of such errors the 864 performs independently of the PC exactly specified special sequences so that the target device remains intact. 864 performs **self test** (diagnostic tests), including verification of pin-driver voltage/level, for accurate timing of the signals



applied to the target device and for reliable communication with the PC.

864 incorporates optimal PCB design criteria to minimize unwanted effects at the pins of the target socket (such as ground-bouncing and supply/programming voltage glitches). All the inputs of the 864, including the socket, are **protected against ESD** and whilst inserted the target device is also protected against ESD damage.

864 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.

864 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 load of file.

The rich-featured **autoincrement function** enables to assign individual serial numbers to each programmed device - or simply increments a serial number, or the function enables to read serial numbers or any programmed device identification signatures from a file.

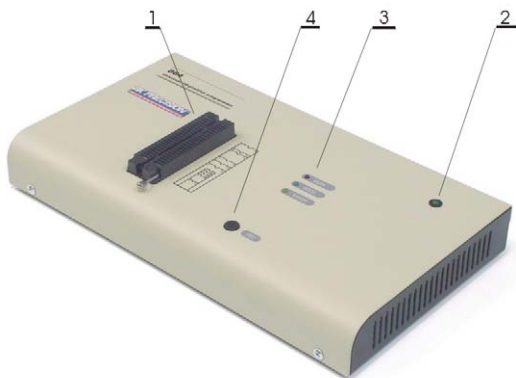
The software also provides a many informations about programmed device. As a special, the drawing of all available packages are provided. The software provide also explanation of chip labeling (the meaning of prefixes and suffixes at the chips) for each supported chip.

It is important to remember that in most cases new devices require **only a software upgrade** since the 864 has 48 true pin drivers, which can perform as required under program control. With our prompt service new devices can be added to the current list within hours!

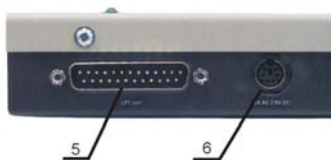
Advanced design, including protection circuits, original brand components and careful manufacturing allows us to provide a **one-year warranty** on parts and labor for the 864 (limited 25,000-cycle warranty on ZIF socket).

864 elements

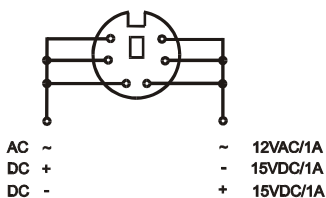
- ① 48 pin ZIF (Zero Insertion Force) socket
- ② LED indicator power/sleep
- ③ LED indicators for work result
- ④ YES! Button



- ⑤ Connector for PC <-> 864 communication cable
- ⑥ Power supply connector



Power supply connector





Note: Due to low power consumption of 864 in inactive state, it doesn't require power switch. When the power LED indicator glows with a low intensity the 864 is in inactive mode.

Connecting 864 to the PC

Switch off PC and programmer. Insert the communication cable included with your 864 programmer package to a free printer port on your PC. If your computer is equipped with only one printer port, substitute the programmer cable for the printer cable. Connect the opposite cable end to the programmer. Screw on both connectors to counter-connectors. This is very important. It may be uncomfortable to switch between printer cable and programmer cable, though it is not recommended to operate the 864 programmer through a mechanical printer switch. Use of an electronic printer switch is impossible. But you can install a second multi-I/O in your computer, thus obtaining a supplementary printer port, says LPT2. So your printer may remain on LPT1 while the programmer on LPT2.

Switch on the PC.

Connect the mains connector of the power supply (or the wall-plug power supply itself) to a mains plug, then connect the mini-DIN connector to the programmer's connector labeled "12VAC". At this time all 'work result' LEDs (and 'POWER' LED) light up successive and then switch off. Once the POWER LED lights with low brightness then the 864 programmer is ready to run.

Next run the control program for 864.

Note: When the PC is switch off and you turn on programmer, LED maybe not blinking, before programmer maybe permanent on reset.

Caution! If you don't want to switch off your PC when connecting the 864, proceed as follows:

- **When connecting** the programmer to the PC: **FIRST** insert the **communications cable** and **THEN** the **power-supply connector**.
- **When disconnecting** the programmer from the PC: **FIRST** disconnect the **power-supply connector** and **THEN** the **communication cable**.

From 864's point of view the connecting and disconnecting sequence is irrelevant. Protection circuits on all programmer inputs keep it safe. **But think of your PC please.**

Problems related to the 864 ⇔ PC interconnection, and their removing

If you have any problems with 864 ⇔ PC interconnection, see section **Common notes** please.

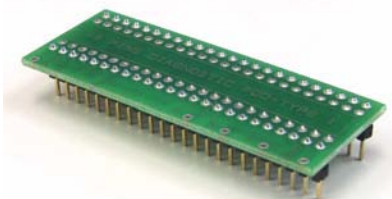
Manipulation with the programmed device

After selection of desired device for your work, you can insert into the open ZIF socket (the lever is up) and close socket (the lever is down). The correct orientation of the programmed device in ZIF socket is shown on the picture near ZIF socket on the programmer's cover. The programmed device is necessary to insert into the socket also to remove from the socket when LED BUSY light off.

Note: *Programmer's protection electronics protect the target device and the programmer itself against either short or long-term power failures and, partly, also against a PC failure. However, it is not possible to grant the integrity of the target device due to incorrect, user-selected programming parameters. Target device may be not destroyed by forced interruption of the control program (reset or switch-off PC), by removing the physical connection to the programmer, but the content of actually programmed cell may remains undefined. Don't unplug the target device from the ZIF socket during work with devices (LED BUSY shine).*

Self test and Calibration

If you feel that your programmer does not react according to your expectation, please run the programmer self test using Diagnostic POD, enclosed with the standard delivery package. For optimal results with programmer we recommend you undertake every 6 months, an extended test and to check the calibration. See instructions for self test in the **Diagnostics** menu of PG4UW.





Technical specification

HARDWARE

Socket, pin drivers and DACs

- 48-pin DIL ZIF (Zero Insertion Force) socket accepts both 300/600 mil devices up to 48-pin
- Three D/A converters for VCCP, VPP1, and VPP2, with controllable rise and fall time and current limitation
- TTL driver provides H, L, CLK, pull-up, pull-down, or tri-state on all 48 pins
- full support of Low Voltage circuits from 1.8 V up
- autocalibration

DEVICE SUPPORT

Programmer

- EPROM: NMOS/CMOS, 1702*, 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 32Mbit, 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
- 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
- PLD: Lattice: ispGAL22V10x, ispLSI1xxx, ispLSI1xxxEA, ispLSI2xxx, ispLSI2xxxA, ispLSI2xxxE, ispLSI2xxxV, ispLSI2xxxVE, 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 87C748..752

series, Philips LPC series, Cygnal/Silicon Laborat. C8051 series

- Microcontrollers Intel 196 series: 87C196 KB/KC/KD/KT/KR/...
- Microcontrollers Atmel AVR: AT90Sxxxx, ATtiny series
- Microcontrollers ELAN: EM78Pxxx
- Microcontrollers Microchip PICmicro: PIC10xxx, PIC12Cxxx, PIC16C5x, PIC16Cxxx, PIC17Cxxx, PIC18Cxxx, dsPIC series
- Microcontrollers Motorola: 68HC11 series (1)
- Microcontrollers National: COP8xxx series
- Microcontrollers NEC: uPD78Pxxx series
- Microcontrollers Scenix (Ubicom): SXxxx series
- Microcontrollers SGS-Thomson: ST6xx series
- Microcontrollers TI: MSP430 series
- Microcontrollers ZILOG: Z86xxx series
- Microcontrollers other: Cypress, EM Microelectronic, Fujitsu, Goal Semiconductor, Princeton, Macronix, Winbond, Hitachi, Holtek, Infineon(Siemens), NEC, Samsung, Toshiba, ...

Note:

- *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

- package support includes DIP, PLCC, SOIC, PSOP, SSOP, TSOP, TSSOP, TQFP, QFN (MLF), SDIP, BGA and other
- support all devices in DIP with default ZIF-48 socket
- support devices in non-DIP packages up to 48 pin with universal adapter (optional accessory, to be ordered separately)
- compatible with third-party adapters for non-DIP support

Programming speed

Device	Operation	Time
27C010	programming and verify	39 sec
AT29C040A	programming and verify	75 sec
AM29F040	programming and verify	165 sec
PIC16C67	programming and verify	30 sec

Conditions: P4, 2,4GHz,ECP, Windows XP



SOFTWARE

- **Algorithms:** only manufacturer approved or certified algorithms are used.
- **Algorithm updates:** software updates are available approx. every 2 weeks, free of charge.
- **Main features:** revision history, session logging, on-line help, device and algorithm information

Device operations

- **standard:**
 - automatic ID-based selection of EPROM/Flash EPROM
 - blank check
 - read
 - program
 - verify
 - erase
 - configuration and security bit program
 - illegal bit test
 - checksum
- **security**
 - insertion test
 - contact check
 - ID byte check
- **special**
 - production mode (automatic start immediately after device insertion)
 - automatic device serial number incrementation
 - statistics
 - count-down

Buffer operations

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

Supported file formats

- unformatted (raw) binary
- HEX: Intel, Intel EXT, Motorola S, MOS, Exormax, Tektronix, ASCII-space-HEX
- POF (Altera), JEDEC (ver. 3.0.A), for example from ABEL, CUPL, PALASM, TANGO PLD, OrCAD PLD, PLD Designer ISDATA etc.

PC system requirements

See section *Introduction/ PC requirements*

GENERAL

- operating voltage 12..15V AC, max.1A or 15..18V DC, max. 1A
- power consumption - max. 12W in active, 1.5W inactive
- dimensions 275x157x47 mm (10.8x6.2x1.9 inch)
- weight (without external adapter) 1.5kg (3.3 lb)
- temperature 5°C ÷ 40°C (41°F ÷ 104°F)
- humidity 20%.80%, non condensing

Package included

- 864 programmer
- connection cable PC-programmer
- diagnostic POD for self test
- anti-dust cover to ZIF socket
- switching power adapter 100..240V AC/15V DC/1A
- user manual
- software
- registration card
- transport case

Additional services

- AlgOR
- free technical support (phone/fax/e-mail).
- free lifetime software update via Web site.