- Portable
- Compact
- One button operation
- Comprehensive device support
- Field or production use
- 3V - 5.5V operation
- Bulk Erase command needs 4.5V
- High and Low Voltage Programming

Device Support:

All PIC18F Devices but total memory available is 64KB.

PIC16F devices - See Page 3

Note Programmer is powered from target and operates down to 3V but Bulk Erase command needs 4.5V minimum target voltage

For full 128KB Plus EEPROM, better low voltage support and faster p r o g r a m m i n g speeds, see our H a n d - h e l d Programmer - **PIC-HH0010**

Order Code PIC-KF0010

For **MICROCHIP**
PICMicro®

PIC Keyfob Field Programmer

A portable ISP in a Keyfob package

The Keyfob

The ultimate programming tool for PIC microcontrollers, in the field or on the production line - so easy a child can use it! The smallest stand-alone programmer for PIC available, just load it once and then program target devices again and again and again.

One Keyfob Starter Kit = Many Keyfobs

You require just one starter kit for your PC and you can load as many keyfobs as you need. Just connect the starter kit dongle to your printer port and run the master software. Select your program and EEPROM data files, device type and Fuse settings and now you can load the keyfobs with your program or test code in seconds. As the Keyfob is battery powered during load, you don't need any power supplies or cabling, just plug a Keyfob into the lead supplied. Once a Keyfob is loaded, it is completely portable and can be used where you need it, not where your PC is located.

LOAD

MOVE

PROGRAM

Field Updates

Think how often you need a simple upgrade to a vending machine, slot machine or other equipment such as lifts, security controls or medical equipment - simple, except it is hundreds of miles away. The rugged design and simple operation of this unique programmer means that you can "let the Keyfob do the walking" by sending the Keyfob rather than an expensive engineer.

Production line

Wouldn't it be nice to have a simple to use, completely portable yet low cost programmer, which can be loaded with different program code or test vectors, available where required on the production floor? Not possible? It is now, with the Keyfob programmer - one button operation, auto sensing of target, auto verification and error indicator - that's really simple to use. Fits on a key ring and weighs less than one ounce - that's portable!

The keyfob programmer elimates operator errors.

Kanda:com

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Target Voltages

The Keyfob includes a 12V battery but this is only used for loading from the PC so you will need power on your target circuit. The PIC keyfob programmer will program target circuits down to 3V but there are limitations with the PIC microcontroller below 4.5V as the Bulk Erase command does not work. This means that below 4.5V, locked devices cannot be re-programmed, nor can the configuration bytes or write protect bits.

- 3V to 5.5V target circuit voltage
- 4.5V minumum target voltage for Bulk Erase command to work
- Below 4.5V, Configuration Bytes, write protect bits and locked memory cannot be re-programmed as Bulk Erase does not work
- Handheld programmer can power low voltage targets at 4.5V unlike keyfob which can not power target
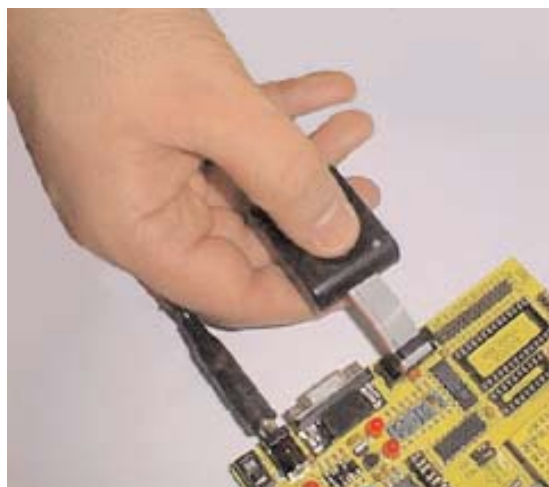
Device Support

You need flexibility when it comes to choosing a device so we have made sure that the Keyfob supports as many devices as possible.

- Most PIC18F and PIC16F devices are supported - see www.kanda.com/support for latest list
- Maximum code size is 64 Kbytes on devices with no EEPROM and 56KB for devices with EEPROM - See Handheld programmer for 128KByte support
- Devices such as PIC16F628 that require Vpp before Vdd are only supported in Low Voltage Programming (LVP) mode.
- Automatically loads and verifies the Code memory, data EEPROM, User ID, configuration bytes and write protection bits, if required

Programmer details

Small, light and completely portable, the Keyfob is the most flexible programming tool around. It measures just 4.5 by 3 by 1.3 cm - which is 1.8 by 1.3 by 0.5 inches for you non-metric types! It weighs just 27g (one ounce) so it is great value and easy to post or carry on your key ring. To give you really long life, the Keyfob can be loaded with new code thousands of times as it uses serial E2 technology. The 12V alkaline battery fitted in the Keyfob, used for loading the Keyfob from the PC, can power more than 50 reloads. This battery is a standard car key fob type so it is easy to source and we even include a spare in the starter kit. A 12V generator for High Voltage programming and an adapter for converting the 10-way connector to 6 Flying leads come with the programmer.

Order Numbers

To help you get just what you need for your application, we can offer you a range of options.

Product	Order Number
Keyfob Starter kit	PIC-KF0010
Individual Keyfob Only	PIC-KF0020
Multipack (pack of 5 keyfobs)	PIC-KF0030
Field Service Pack (Starter kit plus 5 keyfobs)	PIC-KF0040

YOU MUST HAVE A KEYFOB STARTER KIT TO LOAD THE INDIVIDUAL KEYFOBS

For full 128KB flash support plus EEPROM, see our Hand-held programmer - **PIC-HH0010**. This programmer has additional benefits including 9V PP3 battery, power supply socket, better low voltage support as it can power target.

Battery

Battery Specification

SIZE: 23A   - 26mm x 10mm Diameter (1 inch x 0.4 inches)
TYPE: ALKALINE
VOLTAGE: 12V
CAPACITY: 38mAH (current drawn not specified).
AVAILABILITY: Auto warehouses/motor factors (standard car keyfob battery)

Current Consumption

1) Loading Keyfob from PC

KEYFOB during firmware download   :   12mA
KEYFOB in idle mode (connected to PC)   :   6mA
KEYFOB during EEPROM programming :   15mA

Do NOT leave keyfob attached to PC for long periods as this will flatten battery.

2) Target Programming

The target must be powered as the keyfob programmer cannot supply power to the target. The keyfob can operate with a target voltage down to 3V. Note that below 4.5V the PIC micro-controller does NOT support Bulk Erase, therefore Configuration and Code Protection Bits cannot be erased. So if code Protection Bits are set, the Flash and EEPROM memories CAN-NOT be reprogrammed using the keyfob. See our Handheld Programmer for an alternative that can power low voltage targets at 4.5V.

Connectors

The 10-way pin-out of the keyfob programmer is shown here. A 10-way to 6-way flying lead adapter is supplied, with an optional 12V generator board for High Voltage Programming.
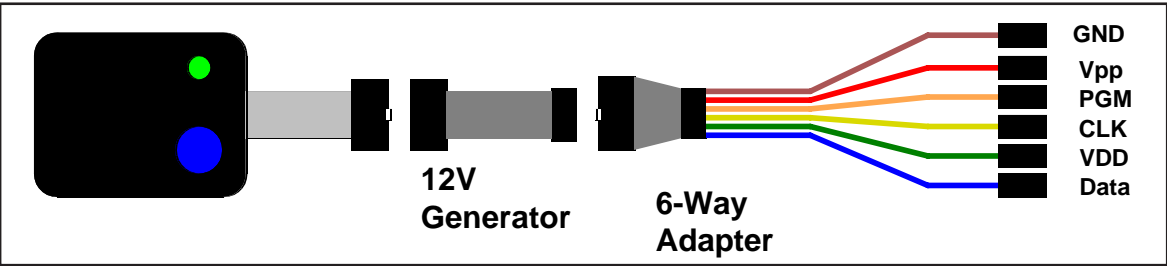
10-way Keyfob output
End of lead view   **6-way flying leads**

Data - PGD	9	10	GND
Clock - PGC	7	8	GND
MCLR/Vpp	5	6	GND
PGM	3	4	GND
N/C	1	2	VDD

Brown	———	GND
Red	———	MCLR/Vpp
Orange	———	PGM/LVP
Yellow	———	Clk PGC
Green	———	VDD
Blue	———	Data PGD

For Low Voltage programming, connect 6-way adapter directly to key fob programmer. For High Voltage Programming, insert 12V generator board between keyfob and adapter as shown below.

12V Generator   6-Way Adapter   GND / Vpp / PGM / CLK / VDD / Data
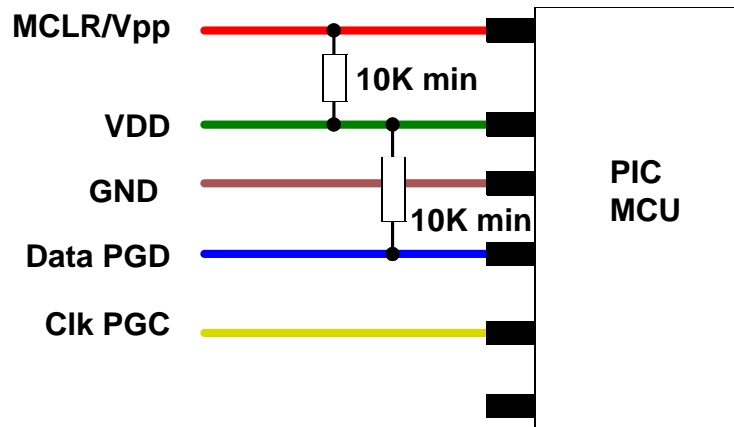
Programming Modes

The keyfob programmer supports both Low Voltage Programming (LVP) and High Voltage Programming (HVP) modes. You can select which mode you require during keyfob loading from the PC.

Target application must supply Vdd to programmer. Although the keyfob will work down to 3V, Bulk Erase will only work at target voltages above 4.5V. So locked devices can only be reprogrammed with VDD > 4.5V. Please ensure that your application does not affect Data, Clock and MCLR lines by using serial resistors or other method.

High Voltage Programming - HVP

For HVP mode, connect the supplied 12V generator board as shown above and leave PGM pin (LVP pin) disconnected .

MCLR/Vpp

10K min

VDD
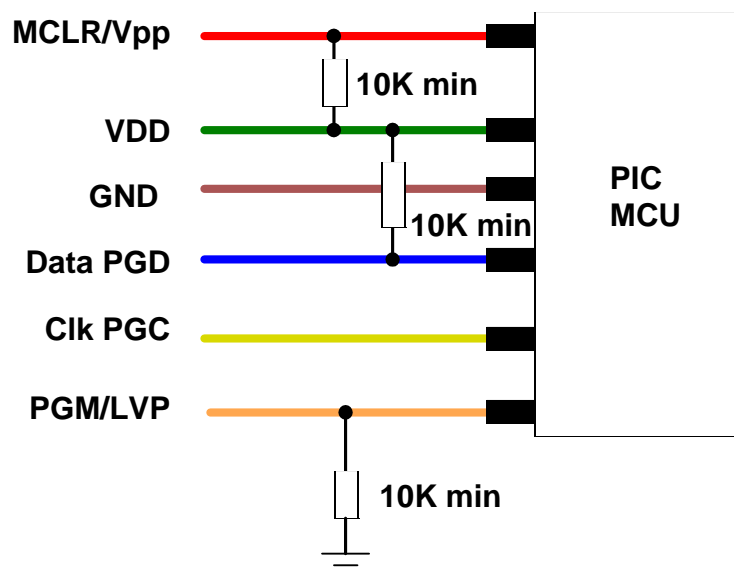
GND

10K min

Data PGD

Clk PGC

PIC MCU

12V High Voltage Programming Mode

The resistor shown on Data line is optional, and can be up to 100K.

The resistor on MCLR/Vpp line must be included and should be in the range of 10K to 100K.

Low Voltage Programming - LVP

For LVP mode, omit the 12V generator board and connect PGM pin. Ensure Low voltage ICSP select bit is set during keyfob load.

MCLR/Vpp

10K min

VDD

GND

10K min

Data PGD

Clk PGC

PGM/LVP

10K min

PIC MCU

5V Low Voltage Programming Mode

The resistor shown on Data line is optional, and can be up to 100K.

The resistor on MCLR/Vpp line must be included and should be in the range of 10K to 100K.

The pull-down resistor on PGM/LVP pin is required, and should be in the range of 10K to 100K

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