KEYFOB PROGRAMMER QUICK START GUIDE

IMPORTANT INFORMATION

1) Do not leave the programmer connected to the PC adapter or a target system, as this will drain the battery.

Installing Software

1) Run the executable file on the CD. This will install software and pre-install USB drivers.

2) Plugin PC dongle to a USB port. The drivers should install automatically. If they do not, see Troubleshooting section

LOADING FROM THE PC

1) Connect the PC adapter (dongle) to the PC USB port.

2) Connect the PC adapter directly to the programmer using the short ribbon cable.

3) To load code, follow the instructions in the software.
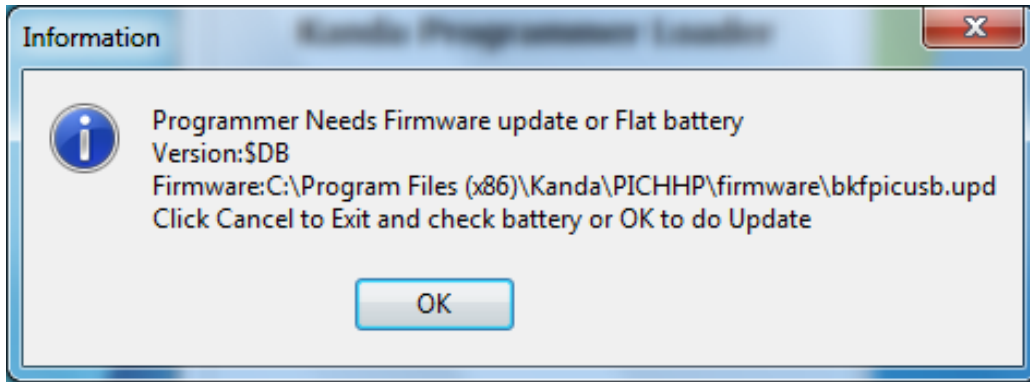
Run the Keyfob Programmer software

a) If USB dongle is not detected, or another Kanda dongle is present, then this error appears. Make sure only one Kanda dongle is plugged in.
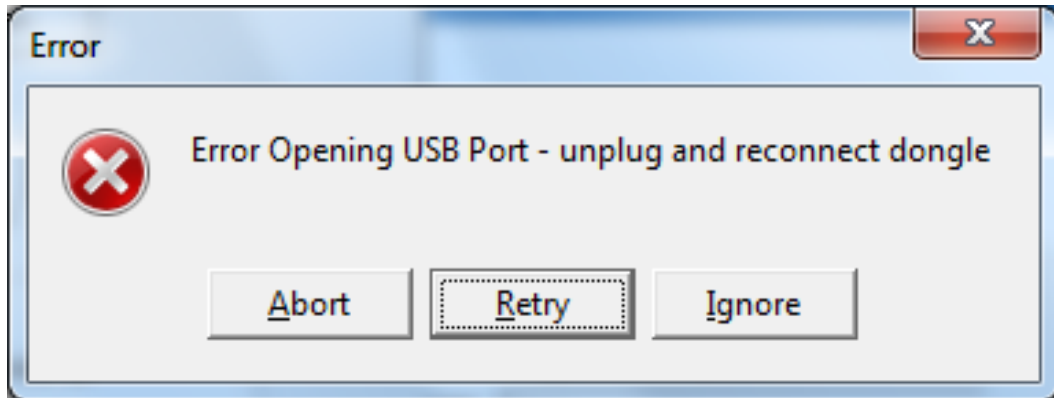

b) If the AVR Programmer is not detected, then this message will appear. Make sure the programmer is connected to the dongle, and the programmer is powered, or battery is Ok.
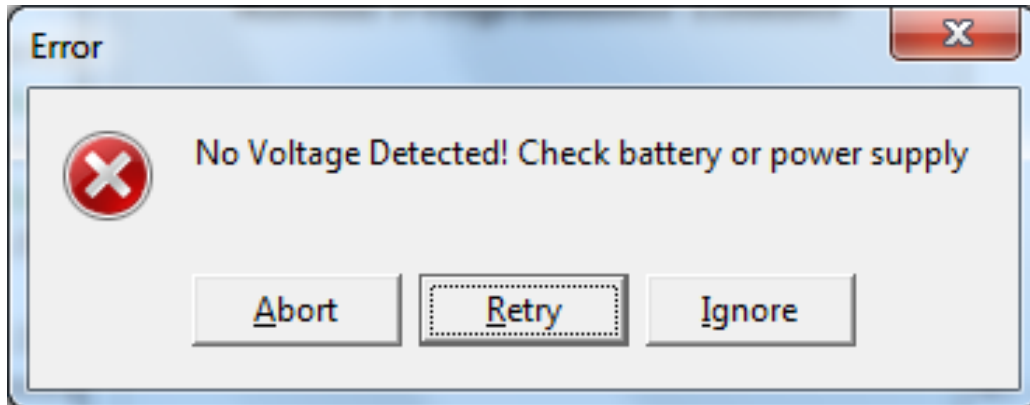
c) To run programmer in Demo mode, Click Ignore. The programmer software will load but you will not be able to Read or Program a programmer until one is connected.

d) If the AVR Programmer requires a firmware update, this message appears. Click OK to carry out firmware update.

Information — Kanda Programmer Loader

Programmer Needs Firmware update or Flat battery
Version:$DB
Firmware:C:\Program Files (x86)\Kanda\PICHHP\firmware\bkfpicusb.upd
Click Cancel to Exit and check battery or OK to do Update

OK

Once the programmer is detected and any firmware update necessary has been carried out, the main programmer window will appear.
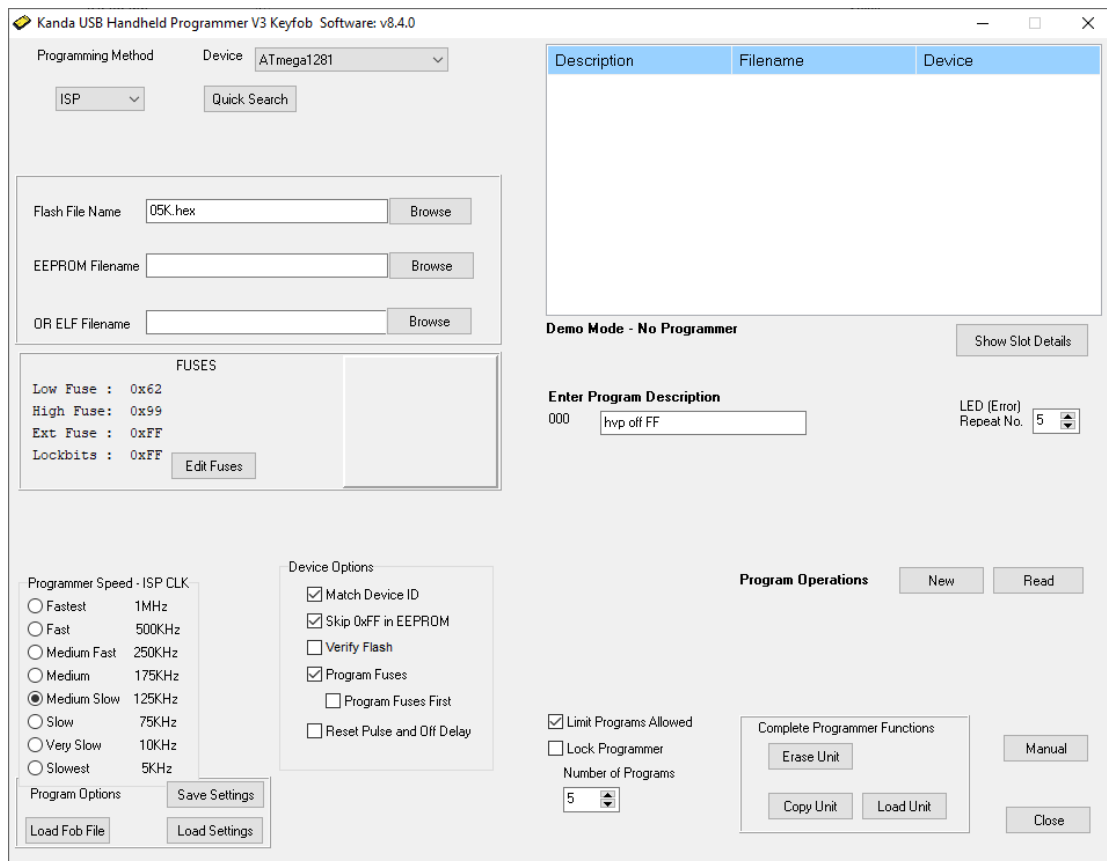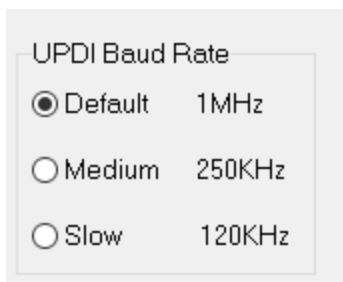

The caption at top will say Keyfob or V3 Keyfob for latest version. Only V3 supports UPDI

The right-hand side of the screen shows the Programmer settings, and the left-hand side shows details about the AVR device, filename, programming method and other details that will be used to load the programmer.

Programmer and Device Setup

- Select **Program Method** - ISP or UPDI
- Select **Device**
- **Flash Filename** box. Enter your flash filename or leave blank if you want to only program EEPROM.
- **EEPROM Filename** box – if AVR device has EEPROM and data is required, then select your EEPROM file
- **ELF filename** box. Load a production ELF file (produced by Atmel Studio 7) *instead* of flash and EEPROM files. This file includes flash, EEPROM, fuses, and lockbits
- **Fuses button** - click to change fuses, see section below.
- **VCC Level** - use slider to select voltage of target circuit
- **Programmer Speed** - Select speed of ISP clock. As a guide, Fastest is for 16MHz target clock, Fast is 8MHz target clock, Medium Fast is 1MHz target clock. Fuse settings on new AVR devices give 1MHz clock by default.

UPDI Speed (V3 Only)

UPDI uses Baud rate. If you get UPDI entry fail or flash verify errors, choose a slower speed.

- **Device Options**

  - **Match Device ID**. If checked, programmer checks that target device ID (signature bytes) match device selected. Error code for mismatch is 7 red flashes.
  - **Skip 0xFF in EEPROM**. ISP only. If checked, locations set to 0xFF in EEPROM file are not programmed. This increases programming speed but old data can be left in EEPROM
  - **Verify Flash**. ISP only, UPDI always verifies flash. Check to verify flash memory, which is best practice. If unchecked, flash is not verified, which is faster.
  - **Program Fuses**. Check to program fuses and lock bits, with values set by Fuse button.

- **Program Fuses First**. Check to program fuses before device is erased. This is useful for setting EESAVE fuse to preserve EEPROM, for example.
- **Reset Pulse and Off Delay**. Resets AVR after programming with a short delay.

- **Limit Programs Allowed**. If this is checked, the programmer can only be used to program the number of target devices set in the **Number of Programs** box.

- **Lock Programmer**. This is enabled when **Limit Programs** is checked. It will prevent the programmer being copied or reloaded to prevent alterations to the number of programs allowed. The only way to clear it is by choosing **Erase Unit** button.

Other Setup Features

- **Program Description**. You must enter a program description of up to 16 characters. This is displayed in pane at top when programmer is read.
- **LED (Error) repeat No**. If there is an error, a number of red flashes will indicate the cause of the error. This box sets the number of times this code is repeated. Holding mouse over this box will show what error codes are.
  Note: You can press button to program again while error codes are flashing.

Loading the Programmer

Once all these settings have been selected, the programmer can be loaded. The buttons to load the programmer are labelled as **Program Operations**.

The keyfob programmer has buttons to load and read the program.

Click **Load Button** to load the programmer with all the settings, fuses and files we have already selected. This will clear any old settings.

Click **Read** to examine the contents of the programmer.

Fuse Button

Click the Fuse button to edit the Fuses for the currently selected device. If you select a different device, the default fuses will be loaded, otherwise the fuse values you select will be saved.
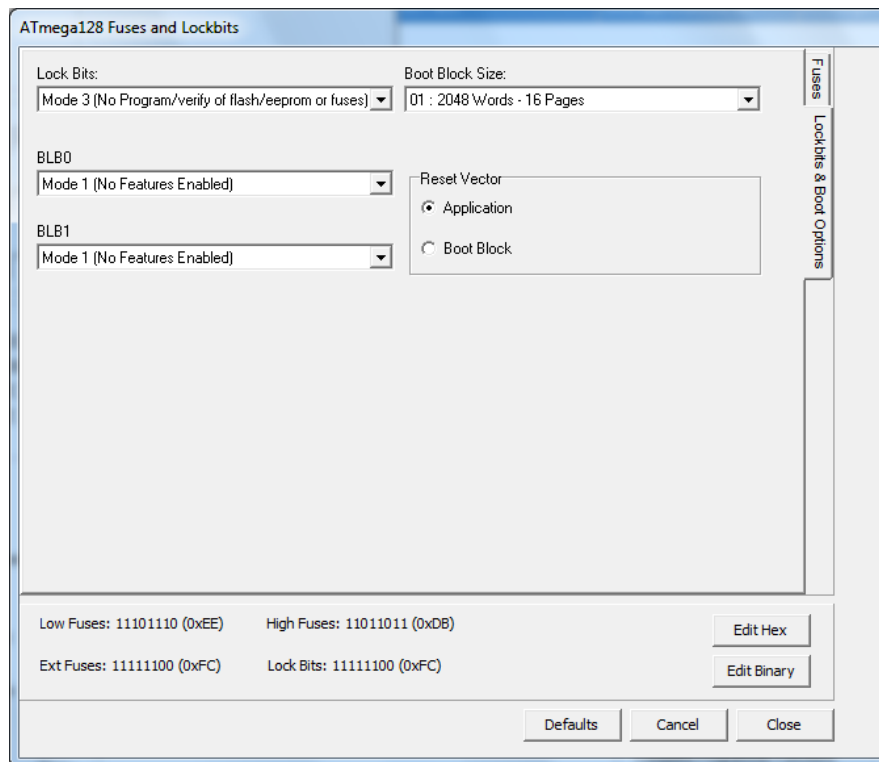
The available fuses and lock bits for the currently selected AVR are displayed. Click on the tab on the right of the screen to **see Lockbits and Boot Block** options.

Enabled AVR fuses (programmed) are actually 0 value. The binary values of each available fuse are displayed at the button of the screen. Click **Edit Binary** button to enter fuse values as binary numbers or **Edit Hex** to enter Hex values.

Default button will load defaults for the AVR device selected

Cancel button will close Fuse box without saving changes

**OK** button will close Fuse box and save your changes.

Program Options
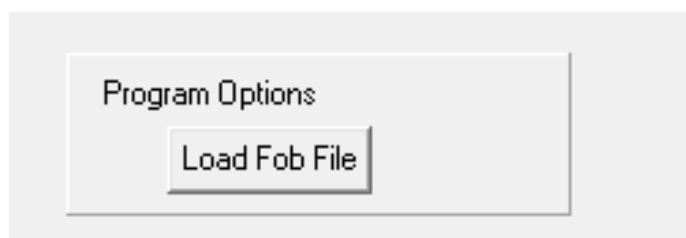
Located at button left of the screen, the **Load Fob File** button allows all the settings to be updated from a Fob file (.fob) that has been saved from earlier versions of AVR programmer software.

The programmer settings are also saved to the registry and when software is run again, these settings will be loaded.

Complete Programmer Functions
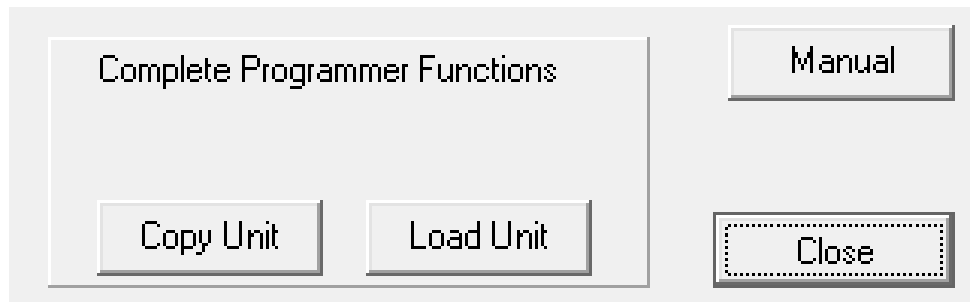
These are at bottom right of screen.

Copy Unit button. This allows the contents of the programmer to be saved to a file (.prg). All the settings and data are saved.

Load Unit button. This allows the settings and data from one programmer previously saved as a PRG file to be loaded into another programmer.

This is the easiest way to load multiple programmers. Load the first one with all the slots you need, then Copy Unit. Use Load Unit to transfer the contents to other programmers.

This is also the simplest way to transfer settings to another user. This replaces the Fob file mechanism used on old AVR keyfob software.

Load from Command line or Process
The software can be launched from a command line or another process by calling avrHHP.exe with a Load parameter and optional .PRG filename parameter, for example

avrHHP Load

This will open PRG open file dialog box. Select file to load programmer

Call it with a second parameter, a .PRG filename eg

avrHHP.exe Load "C:\Test Files\test1.prg" will load this file

The software will run, load the programmer and then close.

To keep the software open after load add a third parameter called SHOW, for example

avrHHP.exe Load "C:\Test Files\test1.prg" SHOW

Programming Target

POWER OPTIONS

The keyfob does not need a battery with the Dongle2 or Dongle3. V3 Keyfob is not fitted with a battery.

The target must be powered and it supplies power to the keyfob so no battery is needed.

The minimum target voltage with the keyfob programmer is 3.3V. For lower voltage support (down to 1.8V), use Hand Held Programmer - order code HH0120V3. The same dongle and software can be used with keyfobs and hand held programmers.

TARGET Connection -ISP

1) Connect the programmer to the target system using the short ribbon cable.

- Target Layout – not end of lead view

- Header is 0.1" (2.54mm) box header in 5 x 2 format, with polarising notch - 10-way IDC header

- See section below for *Six Way adapters*

- GND* These pins must be connected to target ground

- GND One or both must be connected to Target ground

TARGET CONNECTOR FOR AVR PROGRAMMERS

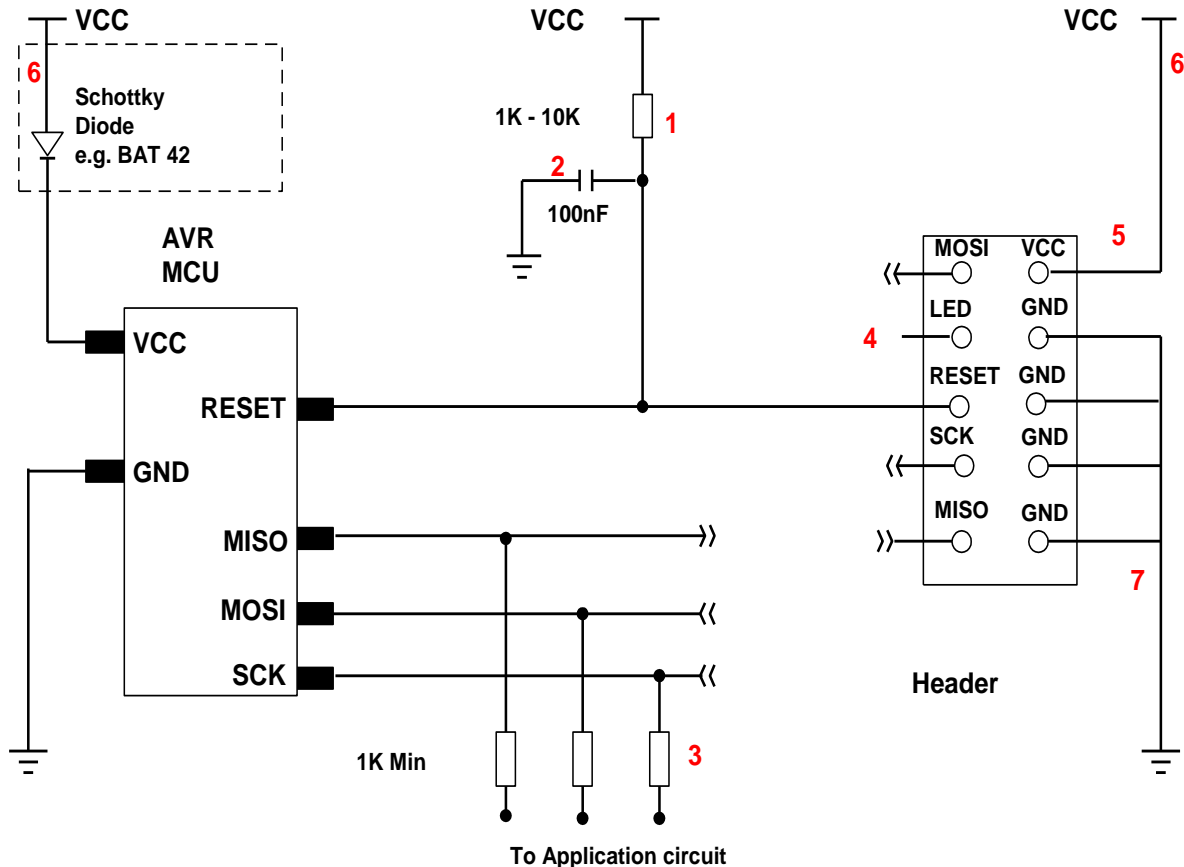|			
MOSI	1	2	VCC
LED OPTIONAL	3	4	GND
RESET	5	6	GND*
CLK	7	8	GND*
MISO	9	10	GND

TOP VIEW OF THE CONNECTOR ON
THE TARGET SYSTEM

0.1" PITCH 2*5 BOXHEADER
WITH POLARISING NOTCH

Recommended ISP Circuit

This diagram shows a typical ISP circuit that will work with the Handheld Programmer. Please read the notes for more detail.

1) This resistor should be fitted. It can larger than 10K if required, but not smaller than 1K

2) Again 100nF is a typical value. We suggest a minimum of 10nF.

3) Programming lines should be isolated from application circuit with series resistors, especially if application circuits force the state of the AVR pins. In exceptional cases, a multiplexer may be needed to isolate these lines. Capacitors on these lines may mean that a slower programming speed should be selected. AVRs that use RX/TX pins for programming eg ATmega128 need at least a 1K resistor for RX line if UART is used.

4) Optional LED line. This can be connected to an indicator LED if desired, or used to drive a multiplexer. It is LOW during programming

5) Not applicable to keyfob programmer

6) Not applicable to keyfob programmer

7) GND pins. We recommend that all GND pins are connected. If not, then either pin 4 or pin 10 MUST be connected – these are programmer Ground. Pin 6 is connected to programmer battery but can be omitted. Pin 8 MUST be connected as it is the mode pin. The programmer uses this pin to check if it is connected to a PC or a target.

Note: The 10-way lead is not wired Pin 1 to Pin 1, so the connector on the programmer shown here is not the same as the end of the 10-way lead.

10-way Connector on Programmer

HAND HELDPROGRAMMER
CONNECTOR (AVR)

GND	1	2	MISO
MODE CONNECT TO GND	3	4	CLK
BAT - CONNECT TO GND	5	6	RESET
GND	7	8	LED OPTIONAL
VCC	9	10	MOSI

TOP VIEW OF THE CONNECTOR ON
THE PROGRAMMER

0.1" PITCH 2*5 BOXHEADER
WITH POLARISING NOTCH

SIX WAY ADAPTERS

Because of the need to connect more than 1 GND pin, the adapter should connect GND pins together. So, the adapter is not as straight forward as it first appears.

Adapters from the 10-way DIL interface to 6-way flying leads, 6-way DIL (Atmel 3 x 2 0.1" pin header), and 6-way Micromatch connectors are available from Kanda. **V3 includes 10DIL6.**

Order Codes are:

10FLEX6   10DIL6   10MICR6

TARGET CONNECTOR FOR AVR
PROGRAMMERS (ATMEL 6WAY)

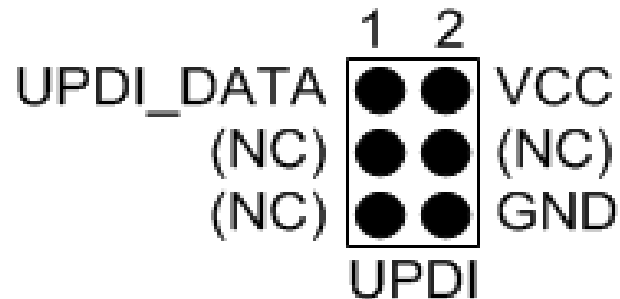| MISO	1	2	VCC
SCK	3	4	MOSI
RESET	5	6	GND
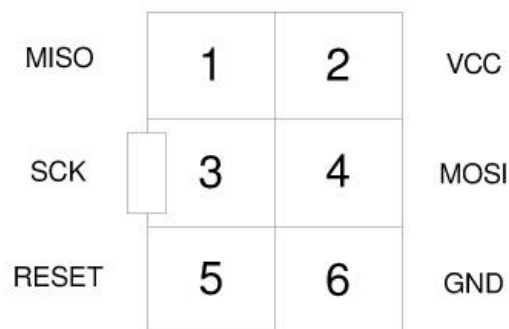
TOP VIEW OF THE CONNECTOR ON
THE TARGET SYSTEM

0.1" PITCH 2*3 BOXHEADER
WITH POLARISING NOTCH

AVR UPDI Programming

Only available on Keyfob Version 3.

Microchip recommend the following layout for ISP header on your target circuit. Only 3 wires need connecting.

The 10DIL6 adapter has this pinout for UPDI, connect it to end of 10-way lead.

If you have a different header layout, you can use 10FLEX6 flying lead. These wires need connecting to the target for AVR UPDI programming

Blue   - UPDI_Data
Green - VCC
Brown - GND

UPDI_DATA is Reset pin on most ATtiny AVR microcontrollers but ATmega UPDI have dedicated UPDI programming pin.

Microchip recommend that no other circuitry is connected to UPDI_DATA.

LED Codes

The programmer will give a brief green flash when plugged in to target. When button is pressed, LED will flicker green during programming. When programming has finished, these codes appear.

Green Flashes, 1 second interval: Programmed OK

2 Red Flashes: Failed to enter ISP. Possible causes:
- No device connected
- Programmer speed too fast for target clock

3 Red Flashes: EEPROM did not verify

4 Red Flashes: Flash did not verify

5 Red Flashes: Fuses/Lockbits did not verify

6 Red Flashes: Program Limit reached

7 Red Flashes: Device ID did not match

8 Red Flashes: Empty programmer

9 Red Flashes: Header checksum error

10 Red Flashes: Flash checksum error

You can press button again to start programming when error codes are still flashing.

TROUBLESHOOTING

Windows driver problems

If you get a driver error or FTDIxx.DLL not found, make sure that you have run the install software from Kanda site and then plugged in programmer, NOT the other way round.

The driver should appear as a "USB Serial Converter" in USB section of Device Manager. Windows should do this automatically. If it does not, please follow this procedure.

- Plugin Programmer and ideally remove other USB devices
- Go to Control Panel > System > Hardware screen
- Click on Device Manager button
- Open USB section and select "USB Serial Converter"
- Right click on it, and select Update Driver
- Driver location is (default install path)
  C:\Program Files\Kanda\AVRHHP\driver\driver

Error Message: "No USB Dongle Found!"
1) If you dongle is plugged in, check FTDI driver in Device Manager. If driver has been updated to 2.12.36 or later, you will need to roll back to 2.12.28 or earlier.
2) Roll back instructions are in Docs folder in install path or can be downloaded here:
   www.kanda.com/files/RollBackDriverGuide.pdf
3) Software version V8.x.x will work with new FTDI driver once Dongle is updated – see Dongle section below.

Error Message: "Programmer is not responding – check connections and battery power"
1) Check dongle is attached to USB port
2) Check that programmer is connected to PC as shown on Page 1
3) Check battery or power supply to the programmer
4) Make sure you have a Keyfob Programmer dongle, not a standard AVRISP-U/STK200 dongle. The unit will say "Dongle2" on it.

Programming Errors – RED Flashes on LED when programming
1) Ensure your target circuit is wired correctly as shown in connection diagrams
2) Slow down programmer speed in software – especially if you have capacitors on programming lines or other unusual circuitry.

Dongle Type

Dongle2
Dongle2, supplied prior to July 2021, will only work with FTDI USB drivers up to 2.12.28. **V8.0.0+** Kanda software allows Dongle2 to be updated to work with FTDI driver 2.12.36 and later.

We recommend that you update your Kanda software to latest version (www.kanda.com/software) and let it update Dongle2 so

that it will work with all FTDI drivers. You may need to roll back the FTDI driver first before update can be done.

Using old software
To continue to use older versions of Kanda software, you will need to roll back the FTDI driver. See www.kanda.com/files/RollBackDriverGuide.pdf for full instructions.

Once Dongle2 has been updated, it will still work with previous versions of Kanda software. All starter kits supplied after June 2021 will contain Dongle3.

Dongle3
Supplied from July 10th 2021. Dongle3 will work with all FTDI drivers and will also work with Kanda software versions below v8.0.0.

FURTHER INFORMATION

Please contact support@kanda.com for technical support or go to our website support pages for latest software.

See **www.kanda.com/support**

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