SILICON ENGINES

14230 CONVERTER

FIRMWARE REPROGRAMMING GUIDE
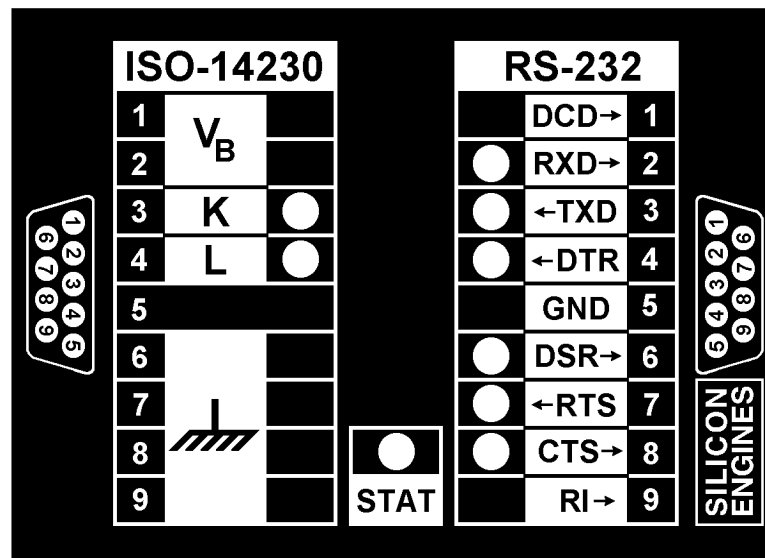
COMMENTS

**We would appreciate receiving
corrections and suggestions
regarding this document
and the product it describes.
Please email to
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1. OVERVIEW

1.1. INTRODUCTION

This document is the Firmware Reprogramming Guide for the Silicon Engines **14230 Converter**, a compact electronic device that allows a personal computer to connect to an automotive diagnostic data link compatible with ISO-14230.

1.2. OPERATING INSTRUCTIONS

For operational details, please refer to the User's Guide.

1.3. ITEMS NEEDED

- **Programming cable:** A specially wired RS-232 cable, described below.
- **Personal computer:** A personal computer with an RS-232 interface, running Windows® or MS-DOS®.
- **Programming software:** A programming utility provided by Silicon Engines that runs on the PC.
- **Firmware file:** A copy of the microcontroller object code to be loaded into the 14230 Converter.

2. PROGRAMMING CABLE

2.1. 14230-PRG CABLE

A special programming cable is required to reprogram the 14230 Converter. This cable can be ordered from Silicon Engines as part number **14230-PRG CABLE** for $25.00. Alternatively you can readily make your own programming cable, as follows.

2.2. CABLE SCHEMATIC
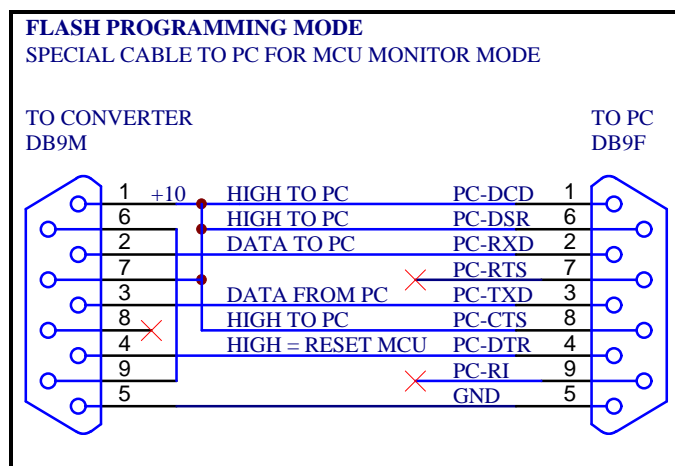
14230 PROGRAMMING CABLE
FIGURE 2.2.1.

2.3.   FABRICATION INSTRUCTIONS

To fabricate this programming cable yourself:

1.   **DB9 cable:** Start with an off-the-shelf straight-through DB9 cable, with a DB9 male connector on one end, and a DB9 female connector at the other end. A cable of this type is readily available from computer retailers. The same type of cable is provided with the 14230 Converter for connecting to the PC (but save that cable, you will need it for normal operation of the 14230 Converter).

2.   **DB9 female end:** The DB9 female end is unmodified. This is the end that plugs into the PC.

3.   **DB9 male end:** Modify this side of the cable. This is the end that plugs into the 14230 Converter.

Remove the connector housing. Leave the wires connecting to pins 1-5 as they were.

Disconnect the wires that connect to pins 6-9 of the DB9 male connector (DB9M-6, DB9M-7, DB9M-8, and DB9M-9). Carefully remove the solder from these four DB9M connector pins.

Cut short the wires that come from DB9F-7 and DB9F-9, they will no longer be used.

Twist together the wires coming from DB9F-6 and DB9F-8, and connect them to DB9M-7. Also connect a short piece of insulated hookup wire from DB9M-7 to DB9M-1. Solder these connections.

Connect another short piece of insulated hookup wire from DB9M-6 to D9M-9, and solder these connections.

4.   **Check-out:** Using a meter, check this cable against the schematic shown above. Replace the connector housing.

5.   **Label:** Make a PROG label for this cable to keep it from being confused with the regular straight-through RS-232 cable used during normal operations of the 14230 Converter.

3.   POWERING THE 14230 CONVERTER

3.1.   14230 CONNECTOR

The 14230 Converter gets its power from the DB9M plug at the left side of its enclosure. A DB9F socket plugs in here. Four signals are supported: VBATT, the ISO-14230 K-line, the ISO-14230 L-line, and ground.

PIN NO.	SYMBOL	SIGNAL	DESCRIPTION
1-2	V_B	VBATT	BATTERY POWER
3	K	K	ISO-14230 K-LINE
4	L	L	ISO-14230 L-LINE
5	▉	NC	*NO CONNECTION*
6-9	⏚	GROUND	POWER AND SIGNAL RETURN

ISO-14230 CONNECTOR PIN-OUTS
FIGURE 3.1.1.

3.2. POWER SOURCE

The 14230 Converter contains built-in power supply circuitry that generates needed power from VBATT and GND. The 14230 Converter is compatible with 12-volt battery systems (8 to 16 VDC), as well as 24-volt systems (16 to 32 VDC).

Connect a DC power source to power the 14230 Converter during programming.

4. PROGRAMMING STEPS

4.1. INSTALL PROGRAMMING SOFTWARE

To program the 14230 Converter you will need a copy of the KXFLASH utility. This is provided by Silicon Engines in compressed format as KXFLASH.ZIP. Use PKUNZI, PKZIPW, or a similar utility to unzip this file, and store the programming utility in a new folder on your computer.

4.2. PLUG IN PROGRAMMING CABLE

Locate the COM port on your PC that you will be using for programming the 14230 Converter.

Attach the DB9F end of the programming cable to the COM port of the PC. Attach the DB9M end of the programming cable to the RS-232 (right) side of the 14230 Converter.

4.3. CYCLE POWER

1. **Turn off power:** Use the power switch on the DC power supply to turn off the power to the 14230 Converter. Alternately remove the connector providing power to the unit. Verify that all lamps on the top panel have shut off.

2. **Delay:** Wait 10 seconds.

3. **Restore power:** Turn the power back on. You should see that the green STATUS lamp on the 14230 Converter top panel is OFF.

4. **Troubleshooting:** If the STATUS lamp comes ON, repeat steps (1) through (3). If the green STATUS lamp refuses to stay off, then the programming cable has been miswired, or this is a defective 14230 Converter. Check the programming cable. Try another 14230 Converter.

4.4. PROG.BAT

1. **PC directory:** Locate the PC directory into which you unzipped KXFLASH.ZIP.

2. **Run the batch file:** Run the file PROG.BAT. Type P R O G. This file can run with no command line arguments UNLESS you are using a COM port OTHER than COM1. If you are using COM2, for example, type P R O G   2 (where the command line argument is the number 2). For COM3, use P R O G   3 (etc.).

3. **Unlock sequence:** The program will begin to execute. You will see a line that says SENDING UNLOCK SEQUENCE. A series of dots will appear on the screen as the process continues. If the program stops with just three dots on the screen, then the PC is not communicating with the 14230 Converter.

> **Note that some operating systems require you to BOOT INTO COMMAND PROMPT (DOS) MODE before the COM port becomes accessible.**

4. **Cycle power:** Remove power for 10 seconds, then turn on again (as in Sec. 4.3 above).

5. **Program continues:** When power returns, the lamps on the 14230 Converter should turn back on again—but the green STATUS lamp should stay off. Press a key on the PC keyboard, and the program will continue to operate. Wait until you get the SUCCESSFUL message before you unplug the 14230 Converter.

5. VERIFICATION

5.1. CHANGE CABLES

To verify that the 14230 Converter has been reprogrammed, first remove the programming cable between the 14230 Converter and the PC. Plug in a straight-through RS-232 cable.

5.2. QUERY REVISION

Use the Silicon Engines ISO-14230 Message Center software—provided with the 14230 Converter—to check the revision level of the 14230 Converter software. Send a QUERY REVISION command. You should see the new revision level on the PC screen.

6. REVISION HISTORY

6.1. REVISION A

Initial release.

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