US Universal
Switching
Corporation

FIELD SERVICE

PROCEDURE

Firmware FLASH Update

Revision A

C710 CPU Series

State-of-the-Art Switching Solutions

TECHNICAL ASSISTANCE

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CONTENTS

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1. Introduction

Universal Switching Corporation products utilize a distributed multiprocessor design where each module installed in the system has an embedded processor to handle all functions and status reporting required. This includes mainframe front panel display and keypad functions.

Our plug-in controller and remote interface module, series C710, offers a host of features and is compatible with all current Universal Switching Corporation systems. The main system firmware is stored on the C710 controller card in flash memory, and may be upgraded while in the field. This is achieved by uploading the new firmware to the **US-Link**/serial service port.

The instructions contained in this manual provide the necessary steps to flash new CPU firmware. Please note that it is required to clear the RAM memory on the newly flashed CPU, this step forces to turn off the system power

> *NOTE: If it's essential to keep the system operating while clearing the memory on a CPU, please contact the factory for additional instructions. This exception ONLY applies to redundant (dual CPU) systems.*

A complete firmware upgrade package is provided on a CD-ROM along with a cable to be connected between a PC system or other serial control device and the CPU's **US-Link**/serial service port.

The series C710 controller CPU/interface assemblies are installed in the following mainframes:

The Series G2S400CE (2RU high) Mainframe.

The Series G2S600CE (3RU high) Mainframe.

The Series G2S1200CE (6RU high) Mainframe.

The Series G2S1600CE (8RU high) Mainframe

The Series S2560D (5RU high) Mainframe.

The Series S2084CE (5RU high) Mainframe.

2. The G2S400CE Mainframe

The G2S400CE mainframe utilizes the XC710 CPU plug-in assembly which is installed on the front of the unit, behind the swing-open front panel. The XC710 plug-in assembly is an integral part of the series C710 interface/CPU product line, designed specifically for the G2S400CE mainframe.

The XC710 CPU plug-in assembly uses an RJ connector which is a standard 10-position RJ-45 type jack. This connector shares both the **US-Link** and the serial service (J9A) port. The J9A port is used as the serial service port for flashing new firmware to the CPU.

As shown below, in the G2S400CE mainframe, the XC710 CPU requires a looping RJ-45 cord that runs from the **US-Link**/serial service (J9A) port to the control loop port.

> 🖐 *NOTE: This cord must be disconnected from the **US-Link**/serial service (J9A) port to perform the flash procedure explained hereafter.*

XC710 CPU
ETHERNET (10BaseT)

PROGRAMMING LED
(RED LIGHT)

CPU RESET SWITCH

US-LINK / SERIAL
SERVICE PORT (J9A)

LOOPING RJ-45 CORD
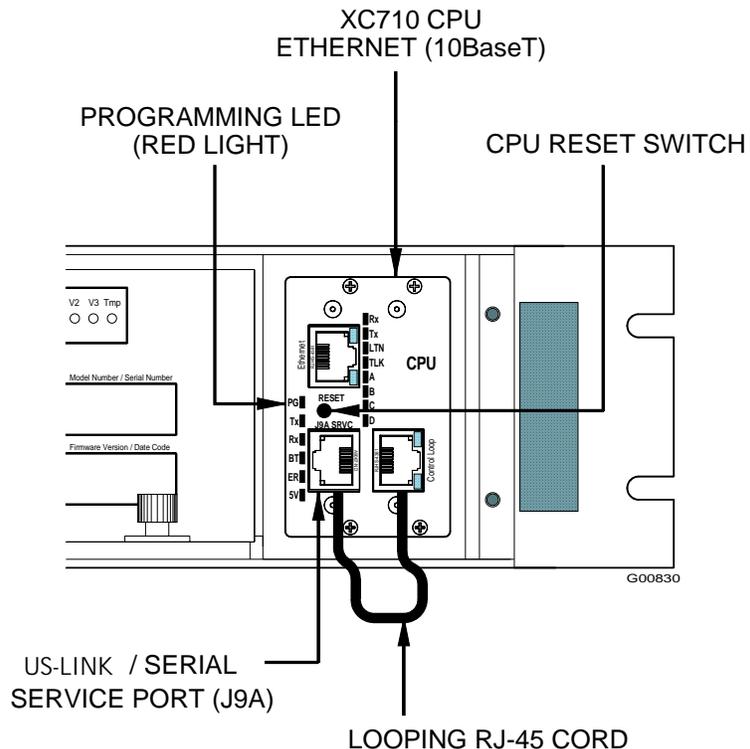
3. The G2S600CE, G2S1200CE, G2S1600CE, S2560D and S2084CE Mainframes

The G2S600CE, G2S1200CE, G2S1600CE, S2560D and S2084C mainframes utilize the series C710 CPU plug-in assembly, installed on the rear of the mainframe. Except for the G2S600CE mainframe, the rest of mainframes are designed for optional dual CPU installation. The series C710 CPU for these mainframes is currently available in the following three different configurations:

C710-S3: Ethernet and Serial (RS-232C/422A/485)

C710-488: Ethernet and GPIB (IEEE-488)

C710-E10: Ethernet control only (10BaseT) (Not Shown)
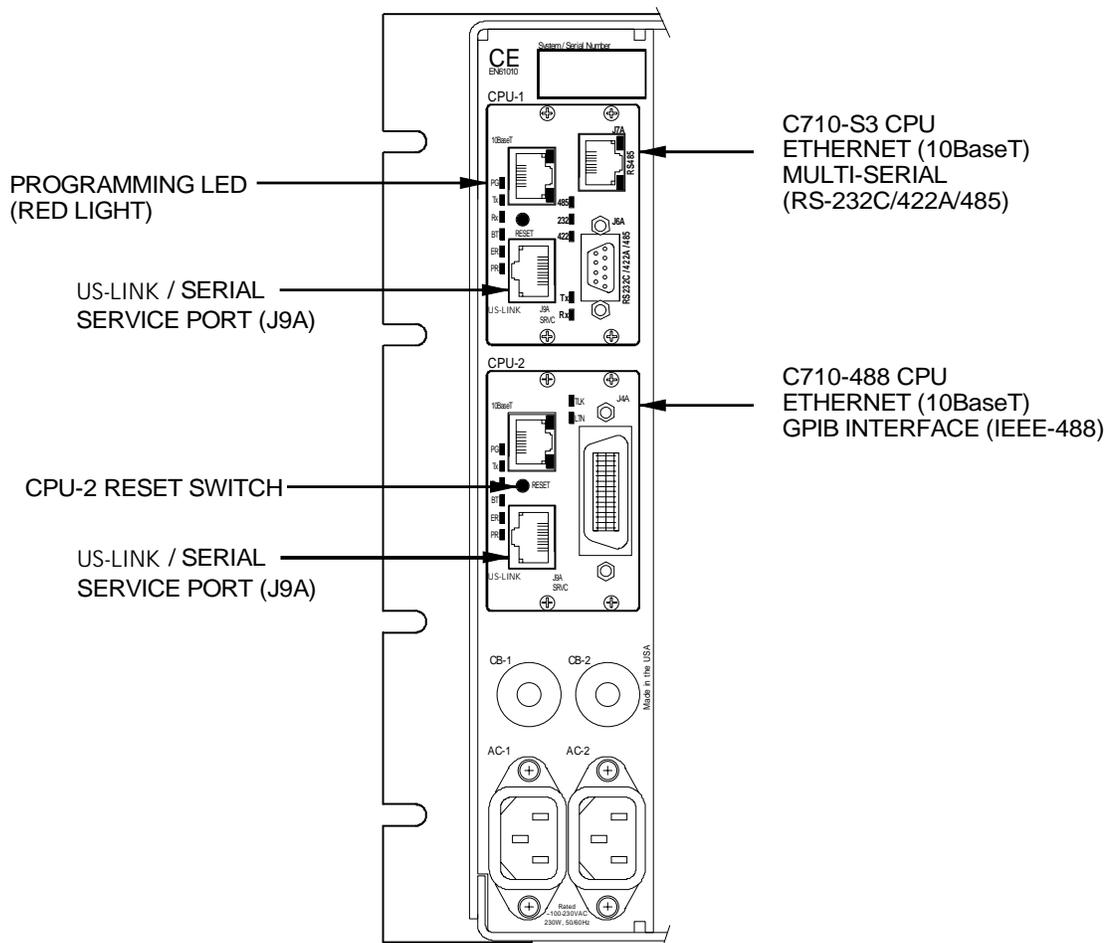
G2S1200CE MAINFRAME   G00831

4.   Serial Service Port (J9A)

The series C710 controller CPU/interface is equipped with a **US-Link**/serial service connector used for remote control functions, to link systems with multiple chassis/mainframes and to flash new firmware to the CPU. Both control and status reporting are passed to/from the remote units through the **US-Link** port.   The **US-Link**/serial service connector also shares the J9A port that is used for uploading new firmware to the CPU.

The **US-Link**/serial service connector used on the series C710 CPUs is a 10-position RJ-45 type jack. The **US-Link** uses only the center 4 positions, pin 4, 5, 6 and 7. The serial service (J9A) port uses the outer 6 positions, pin 1, 2, 3, 8, 9 and 10. See table below.

The serial service (J9A) port is used as the serial service port for flashing new firmware to the CPU. The port utilizes half-duplex RS-232 type of serial transmission. A cable assembly P/N CA350-008 is provided to connect the **US-Link**/serial service (J9A) port to your PC computer or other serial control device.

> 🖐 *NOTE: The special cable P/N CA350-008 <u>must be used</u> to connect your PC to the **US-Link**/service (J9A) port to perform the flash procedure explained hereafter. Severe damage to the CPU may otherwise occur!*

Pin	Signal Assignment (US-Link)	Signal Assignment Serial Service (J9A)
1		Program (ground to activate programming)
2		RxD (used for programming only)
3		TxD (used for programming only)
4	- RS485 (**US-Link**)	
5	+ RS485 (**US-Link**)	
6	GND	
7	GND	
8		DSR (used for programming only)
9		DTR (used for programming only)
10		GND

5. Updating the CPU Firmware

A complete firmware upgrade package is provided on a CD-ROM, via e-mail or may be downloaded. A factory cable is provided to connect the PC or other serial control device to the CPU's **US-Link**/serial service port (J9A). The following procedure outlines the tools, materials, and safety instructions needed to update the CPU flash firmware.

Tools, material and Safety Requirements

The following items are required for this procedure.

- Update Kit Files
- A PC system
- Cable P/N CA350-008
- Anti-Static Protection

Update Kit Files

The firmware update kit files contain all the files required to update firmware. Usually, there are two types of kit folders included: an "update kit folder" and a "fallback folder".

The update kit folder contains the latest CPU firmware.

The fallback kit folder is provided to fall back to the old CPU firmware, if necessary

> ✋ *NOTE: The folders 12345101Kit and 12345101Fallback mentioned in this manual are fictitious folder kit names and are used for example purpose only. Please refer to the IDENTIFYING THE CPU FIRMWARE section of this manual for instructions to identify the firmware's product number, its revision code, and format.*

A PC System

A PC system or other serial control device needs to be cabled into the CPU's **US-Link**/serial service (J9A) port to flash the CPU firmware.

> ✋ *NOTE: The serial ports on laptops in general and Dell Inspiron computers in particular have been known to cause problems. If you intend to use this type of computer, a USB to serial adapter might be required.*

Due to the way the system uses the DTR and DSR lines of the serial interface, not all serial ports or USB<->serial adapters will work. Generally, old serial ports based on the 16550 UART and USB serial adapters based on the FTDI FT8U232xM chips will work just fine.

Examples of the latter are the Siig US2308, EasySync US232B or the WanTeng UE-RA153SC. Up-to-date drivers are always available from www.ftdichip.com in case the installation disc or the manufacturer's web site is out of date.

> ✋ *NOTE: The IOGear GUC232A USB<->serial adapter does __not__ work. Do not use this type of adapter.*

Cable P/N CA350-008

A cable assembly P/N CA350-008 is provided to connect the **US-Link**/serial service port (J9A) to your PC computer or other serial control device. The port utilizes half-duplex RS-232 type of serial transmission

> ✋ *NOTE: The cable P/N CA350-008 must be used to connect your PC to the __US-Link__/service (J9A) port; otherwise severe damage to the CPU may occur.*

Anti-Static Protection

The components inside the C710 controller CPU are extremely sensitive to electrostatic discharge (ESD). Electrostatic discharge can cause irreparable damage to the internal components of the CPU. The technician handling the component must know about static electricity and how to protect the components from ESD.

> ✋ *NOTE: Please follow normal ESD precautions and use anti-static protection to minimize or eliminate possible damage to the sensitive components on the C710 controller CPU.*

Flashing Procedure

1. The files and firmware kit required for this procedure are contained in the folder 12345101Kit or folder 1234501Fallback. Theses folders might be on a CD, zipped into an e-mail or downloaded.

2. If the update kit folder is already on a suitable drive, such as the D: drive, skip this step. Otherwise, copy the update kit folder on any "lettered" drive whether C:, E:, F:, etc. or even on the PC desktop. This procedure **WILL NOT** work if the update kit folder is copied on a file server that has not been mapped (e.g. \\server\12345101kit).

3. For the G2S400CE mainframe only, disconnect the looping cable from the **US-Link**/serial service (J9A) port.

4. Install the cable into the **US-Link**/serial service (J9A) port of the C710 CPU faceplate. The red light (programming LED) should light up.

> 🖐 *NOTE: The cable P/N CA350-008 must be used to connect your PC to the **US-Link**/service (J9A) port; otherwise severe damage to the CPU may occur.*

5. If the red light does not light up; verify that the cable is connected to the **US-Link**/serial service (J9A) port, NOT to the Ethernet port.

6. Plug the other end of the cable into the "standard" serial port of your PC system.

7. Open the update kit folder and identify the binary file (BIN file). Note that on the Microsoft operating systems, the icon for the binary file may look different on every computer.
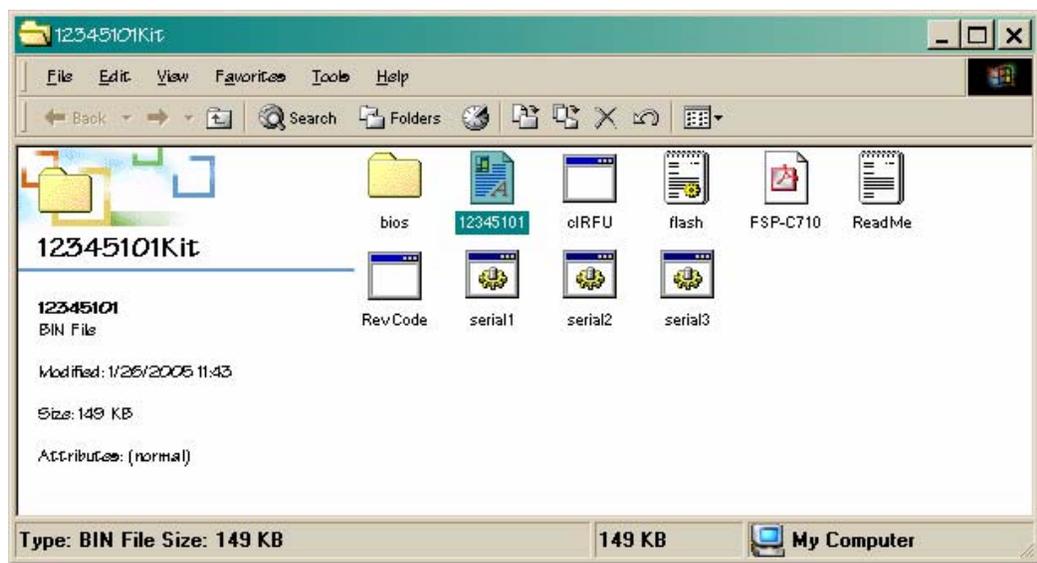
8.   Identify the serial port used, whether **serial1, serial2** or **serial3** port, and then select, drag and drop the binary file onto the applicable serial port icon (the icon should become highlighted) to start flashing the new firmware. The example below shows the binary file 12345101.bin being dragged and dropped onto the serial2 icon.
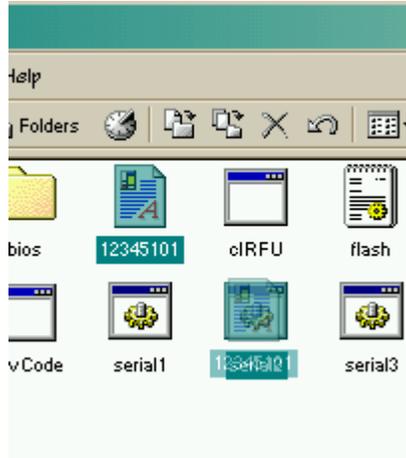
9.   As a result, the following window will appear. Carefully read and follow the instructions and make sure that the product number, its revision code, and format are correct. Press Ctrl-C to terminate or press any other key to continue the flashing procedure.
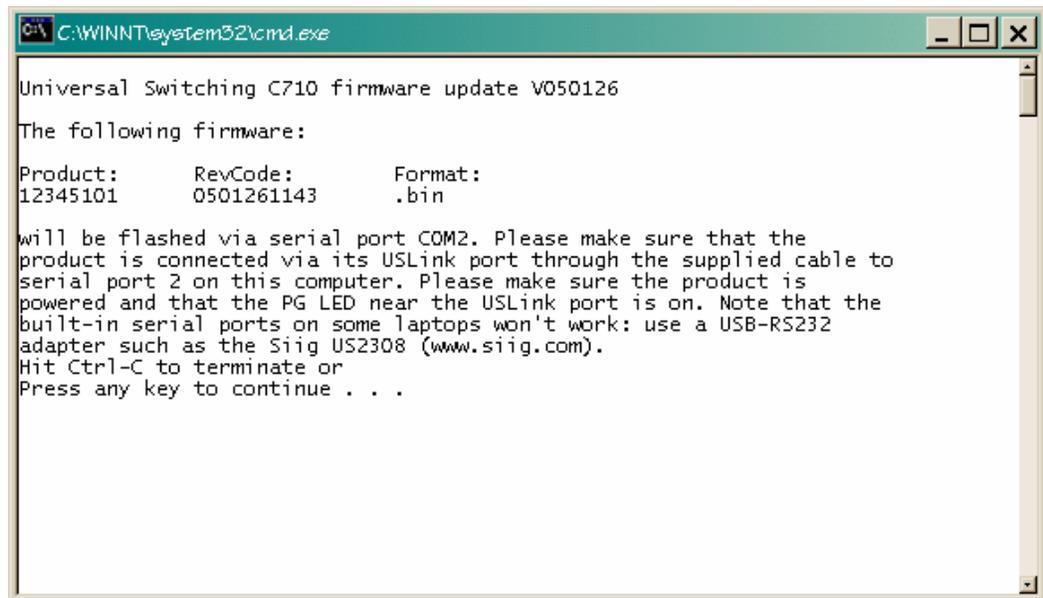
10. After a few seconds, the progress of the flashing will be reported. And when the flashing procedure is completed press any key to exit this window.
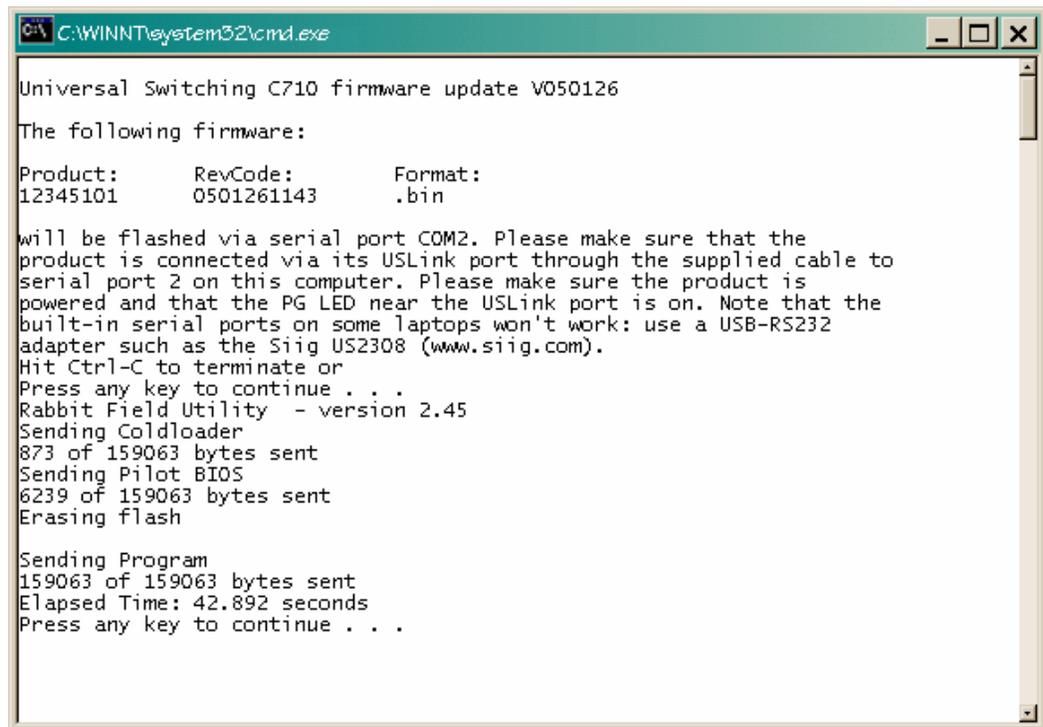
```
C:\WINNT\system32\cmd.exe                                      _ □ ×

Universal Switching C710 firmware update V050126

The following firmware:

Product:        RevCode:        Format:
12345101        0501261143      .bin

will be flashed via serial port COM2. Please make sure that the
product is connected via its USLink port through the supplied cable to
serial port 2 on this computer. Please make sure the product is
powered and that the PG LED near the USLink port is on. Note that the
built-in serial ports on some laptops won't work: use a USB-RS232
adapter such as the Siig US2308 (www.siig.com).
Hit Ctrl-C to terminate or
Press any key to continue . . .
Rabbit Field Utility  - version 2.45
Sending Coldloader
873 of 159063 bytes sent
Sending Pilot BIOS
6239 of 159063 bytes sent
Erasing flash

Sending Program
159063 of 159063 bytes sent
Elapsed Time: 42.892 seconds
Press any key to continue . . .
```

11. Remove the cable from the **US-Link**/serial service port (J9A) and press the CPU reset switch.

12. After the flashing is completed, **clear the RAM** memory on the CPU as outlined in the next section of this manual. This prevents "old" data stored in RAM to interfere with operation of the new firmware.

13. Finally, verify the accuracy of the firmware and revision code. The verification can be done from the front panel after resetting the system or from a response to an *idn? Query.

6. Clearing the RAM Memory

The following procedure outlines the necessary steps to clear the RAM memory on a C710 controller CPU.

Tools and material and safety requirements:

- Phillips Head Screwdriver
- Needle-nose Pliers
- Anti-Static Protection

1. Turn off the system power and disconnect all cables from the CPU.

2. Using a Phillips head screwdriver, remove the four screws and the CPU from the mainframe.

3. Using a pair of needle-nose pliers, carefully remove the jumper from the JP3 position and then place it on the JP4 position for a period of at least one minute. This will clear the RAM memory. After the one minute period, place the jumper back on the JP3 position.

4. Secure the CPU with the four screws previously removed to the mainframe and reconnect all cables. Turn on the system power.
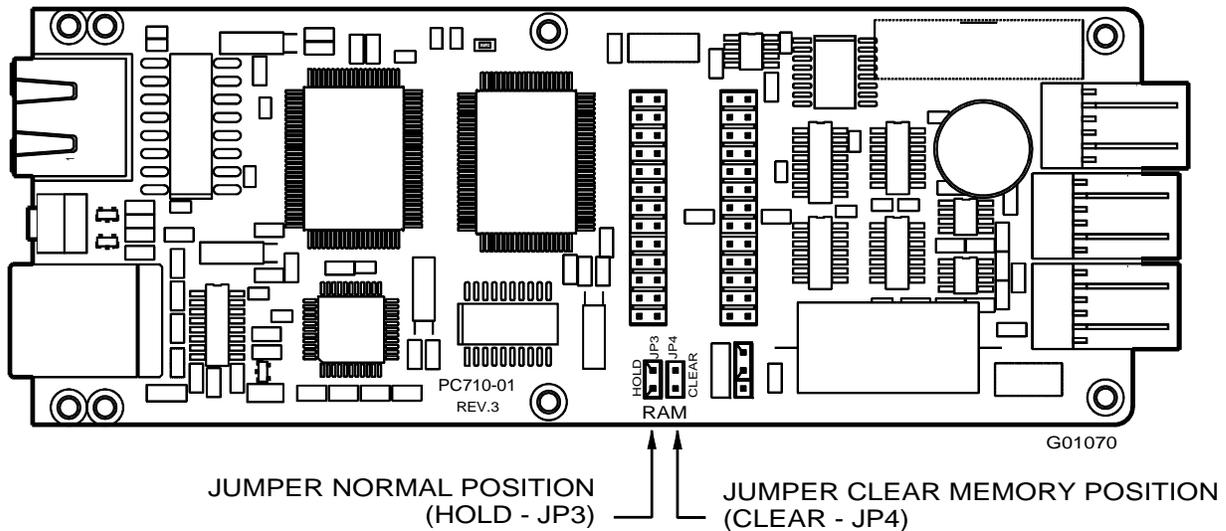
JUMPER NORMAL POSITION
(HOLD - JP3)

JUMPER CLEAR MEMORY POSITION
(CLEAR - JP4)

> NOTE: If it's essential to keep the system operating while clearing the memory on a CPU, please contact the factory for additional instructions. This exception ONLY applies to redundant (dual CPU) systems.

7. Identifying the CPU Firmware

Open the upgrade kit folder and identify the binary file and the executable RevCode.exe program. Note that on the Microsoft operating systems, the icon for the binary file may look different on every computer.
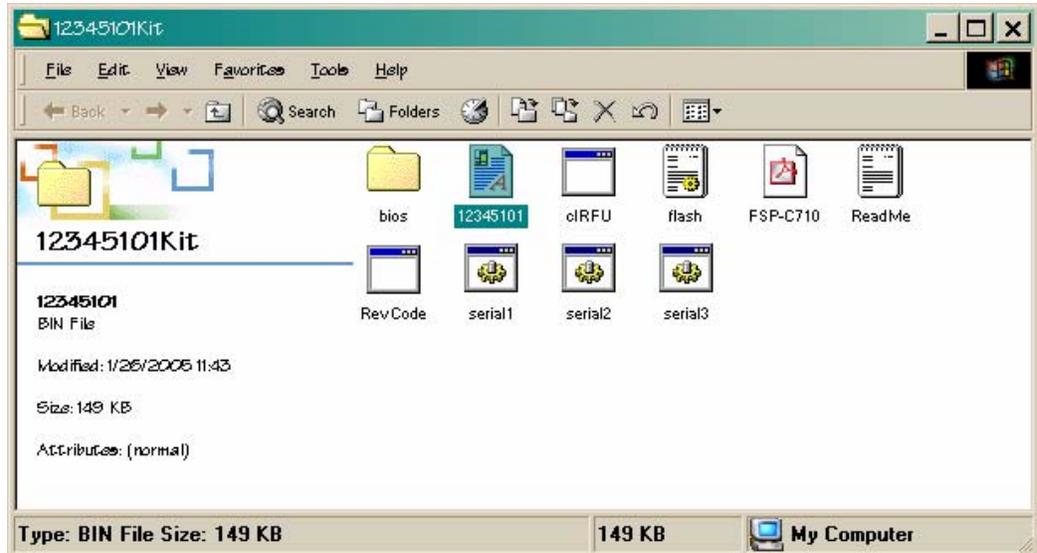
Drag and drop the binary file on the RevCode.exe program. As a result, the following window will appear displaying the product number, its revision code, and format.

14