SIEMENS

QUICK REFERENCE GUIDE TO UPGRADING FIRMWARE (CPLD) IN THE GCP 4000 TRACK MODULE (A80418)

Document Number SIG-QG-09-05
Version B.1

Use the procedure described in this document to upgrade the firmware (CPLD) on the GCP 4000 Track Module, A80418. Prior to performing this procedure verify that the Lattice USB driver software has been installed on your computer and that the new CPLD firmware file has been copied to the computer as described in document SIG-QG-09-04, version B.

WARNING

PRECAUTIONS MUST BE TAKEN BY THE RAILROAD, AUTHORITY, AND/OR ITS REPRESENTATIVES TO ENSURE THE SAFE MOVEMENT OF TRAINS AND/OR TRAVELING PUBLIC PRIOR TO PERFORMING THIS PROCEDURE.

CAUTION

OBSERVE ELECTROSTATIC DISCHARGE (ESD) PRECAUTIONS BY FOLLOWING THE INSTRUCTIONS STATED ON THE ELECTROSTATIC DISCHARGE PRECAUTIONS PAGE OF THE MODEL 4000 GCP APPLICATION GUIDELINES MANUAL.

Materials Required:

a. *Lattice USB driver, version 18_0_1, pre-installed on computer (see Doc. # SIG-QG-09-04, version B).
b. *New CPLD firmware, version 80418_0c.jed pre-loaded on computer (see Doc. # SIG-QG-09-04, version B).
c. Lattice upload cable, P/N 8000-26696-0001
d. Labels, P/N Z630-39658-0001
e. 4000 GCP Crossing System Field Manual (Doc. # SIG-00-08-10, version B, or later).
f. **Hardwire and/or 0.06 ohm shunt.

*The Lattice USB driver and CPLD firmware file are found on the CD provided by Siemens as part of kit number 8K00—8K001-000. The CD part number is Z224-9V517-A010, version B.

**Depending on the change in EZ, it may be necessary to re-calibrate the GCP 4000 track circuit following the installation of the CPLD software.

A. Track Module A80418 CPLD firmware installation

Prior to upgrading the GCP Track Module firmware, observe and record the EZ and EX values for the applicable Track Module. EZ and EX values will be compared to these recorded values following the completion of this procedure. A form is provided at the end of this procedure for recording the EZ and EX values. If the CPLD firmware is being upgraded on multiple GCP 4000 units, make multiple copies of the form before starting the upgrades.

WARNING

DURING THE INSTALLATION OF THIS FIRMWARE IT WILL BE NECESSARY TO REMOVE THE GCP 4000 TRACK MODULE FROM THE GCP 4000 SYSTEM AND AS A RESULT THE WARNING SYSTEM WILL ACTIVATE.

PRECAUTIONS MUST BE TAKEN BY THE RAILROAD, AUTHORITY, AND/OR ITS REPRESENTATIVES TO ENSURE THE SAFE MOVEMENT OF TRAINS AND/OR TRAVELING PUBLIC PRIOR TO PERFORMING THIS PROCEDURE.

1. Remove the Track Module from the GCP 4000 system.

2. Connect the Lattice upload cable supplied with the kit to J2 on the Track module as shown in the photos below. These photos indicate the cable connection on board levels C and D. The connector on B-level Track Modules is rotated 90 degrees counter-clockwise, but the pin numbers remain the same.

Lattice Upload Cable, Part Number 8000-26696-0001
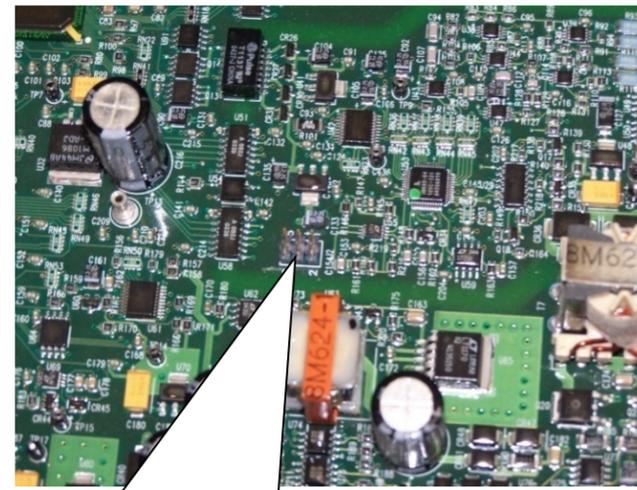
Connect the Lattice upload cable to J-2 on the module. Ensure proper orientation of the cable so pin 6 on the module connects with pin 6 on the cable.

Pin 6 location
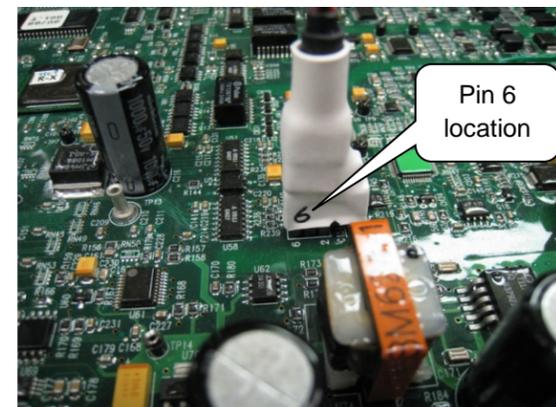
Connection on board levels C and D

NOTE

The male connector on the track module is a 6-pin connector. The female connector on the upload cable provided with the kit is a 10-pin connector. Connector pin numbers are etched on the Track Module surface adjacent to the 6-pin connector. Be sure to orient the cable connector correctly before attaching it to the module connector.

The following table identifies signal pin assignments, wire color code and pin locations on the upload cable connector.

Lattice Upload Interface Cable		
Pin Position	Designation	Color
#1	VCC	Red
#2	GND	Black
#3	TCK	White
#4	TDO	Brown
#5	TDI	Orange
#6	TMS	Violet
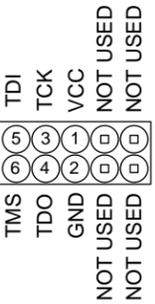
NOTE

The GCP 4000 Track Module DOES NOT need to be inserted into a working GCP 4000 chassis and/or have power applied during the CPLD upload procedure.

3. Connect the other end of the cable to a USB port on the computer.

4. With the Lattice upload cable properly connected between the module and computer, double click the following icon on the computer desk top to start the Lattice ispVM System program.

5. On the opening screen, review the information listed under **Chain configuration1**. If a file name matching the firmware to be uploaded is displayed, proceed to step 12 below. Otherwise, click the **Options** menu button at the top of the screen and on the **Options** drop down menu select **Cable and I/O Port Setup**.
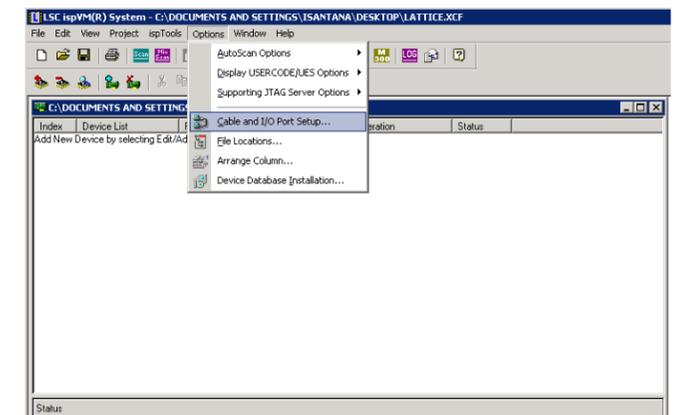
6. In the Port Setting drop down menu select the **USB** option and click **OK**.
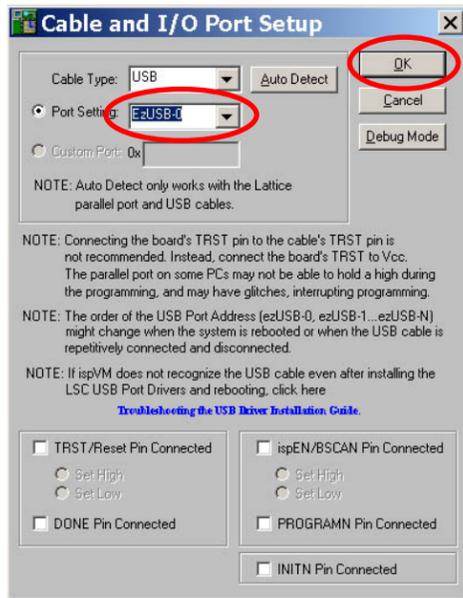
NOTE

If the USB option is not listed in the **Port Setting** drop down menu, click the **Auto Detect** button.

7. Click on the **Add Device (Ins)** icon.
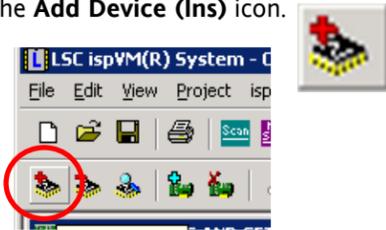
8. On the Device Information screen click **Select**.

9. On the Select Device screen make the following selections:

   Device Family – MACH4A
   Device - iM4A5-64/32
   Package Type - 48-pin TQFP
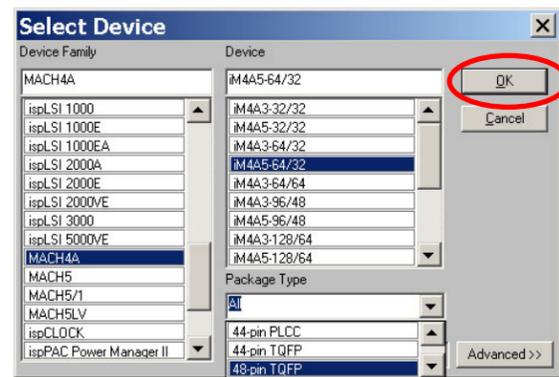
When done click **OK**

10. On the Device Information screen click **Browse**. Locate the CPLD file (**80418_0c.jed)** on your computer. Select the file and click **Open**.
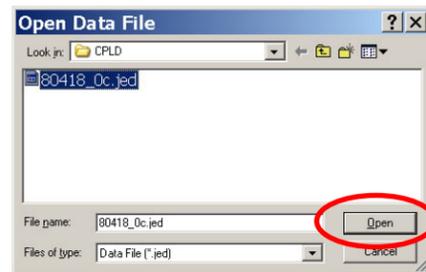
11. The CPLD file name and path should now be displayed in the Device File text box on the Device Information screen. The Operation text box should indicate **Erase, Program, Verify.**   Click **OK**.
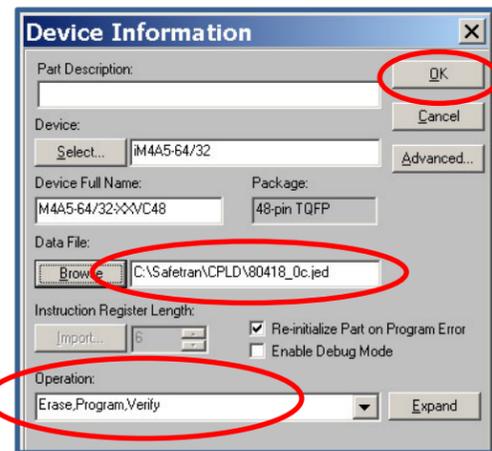
12. Ensure that there is only one file indicated on the following screen and that it is the proper CPLD firmware file. Click **GO** and the software will be uploaded to the GCP 4000 Track Module.

---
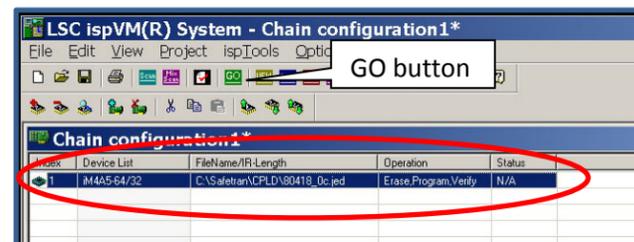
13. The following Progress screen will appear (CPLD upload takes approx. 10 seconds).

14. At the conclusion of the software upload process a confirmation message should appear indicating Status as **PASS** and at the bottom of the screen the words **Operation Successful**.
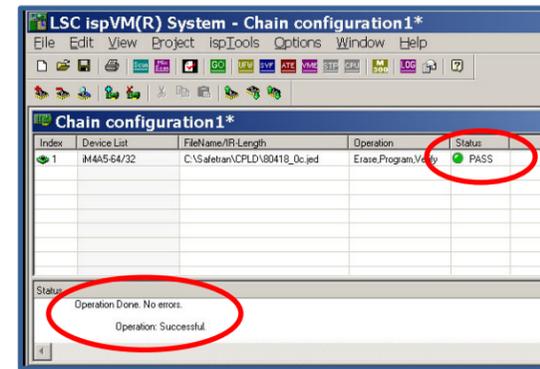
15. If no more modules are to be updated at this time, click **X** in the upper right corner of the screen to close the program. The message below will appear only if this is the first time this software is uploaded.
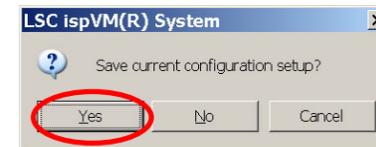
16. By clicking **Yes,** the connection settings can be saved to facilitate the next module upgrade. The following dialog box will appear. In the file name box, type **A01C** and click **Save**.
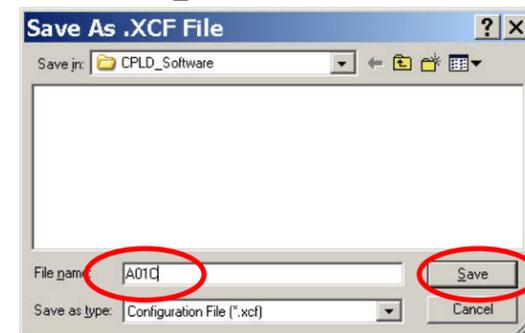
17. Following the successful upgrade of the CPLD software, install the supplied **9V775-A01C** label on the Track Module faceplate as shown here. Observe proper ESD precautions when handling the module.

---
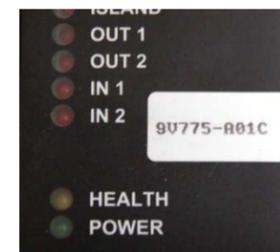
18. This concludes the installation of the CPLD software. To update another track module repeat steps 12 through 14 and step 17 above. Before each upgrade ensure the interface cable is properly connected to the GCP 4000 Track Module.

B. Recommended Re-Test Procedure

Following completion of the CPLD software upgrade, re-install the Track Module in the GCP 4000 chassis. After the module has completed its boot cycle observe its health status as well as the EZ and EX values for the applicable Track Module. Compare these values to the values observed and recorded at the beginning of procedure A above.

If the values match or are within five (5) points of the original EZ value and between EZ 90 and EZ 110, then Siemens recommends testing the GCP by activating the warning system and observing that the crossing warning devices operate as intended to verify that no out-of-service processes have been left in place prior to returning the GCP 4000 to service. NO additional testing is required by Siemens.

However, if these values exceed the recorded values by more than five (5) points or EZ is at or above 110 or less than 90, then Siemens recommends this track circuit/module be re-calibrated per the Siemens 4000 GCP Crossing System Field Manual, document number: SIG-00-08-10, version B or later. **LINEARIZATION** is **NOT** required and should be bypassed.

NOTE

Perform any other tests as prescribed by the railroad and/or authority to ensure proper operation of the warning system and compliance with current rules and regulations.

Record GCP 4000 EZ/EX Operating Values

Location Name/AAR-DOT#:					
MP/Subdivision:					
SIDE	TRACK	BEFORE		AFTER	
		EZ	EX	EZ	EX
MAIN	1				
	2				
	3				
	4				
	5				
	6				
STBY	1				
	2				
	3				
	4				
	5				
	6				