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).
- *New CPLD firmware, version 80418_0c.jed preloaded 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

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**Depending on the change in EZ, it may be necessary to recalibrate 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.



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.

3



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

Lattice Upload Interface Cable				
Pin	Color			
Position				
#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**.

Cable Type: USB 🗸	Auto Detect
Port Setting: EzUSB-0	
C Custom Port: 0x	Debug Mode
NOTE: Auto Detect only works with parallel port and USB cables	the Lattice
NOTE: Connecting the board's TRST not recommended. Instead, co	pin to the cable's TRST pin is innect the board's TRST to Vcc.
The parallel port on some PCs the programming, and may hav	may not be able to hold a high during ve glitches, interrupting programming.
The parallel port on some PCs the programming, and may hav NOTE: The order of the USB Port Add might change when the systen repetitively connected and disc	may not be able to hold a high during ve glitches, interrupting programming. dress (e2USB-0, e2USB-1e2USB-N) n is rebooted or when the USB cable is connected.
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The parallel port on some PCs the programming, and may hav might change when the system repetitively connected and diss NOTE: If ispVM does not recognize th LSC USB Port Drivers and reb Troublehoring the USI	may not be able to hold a high during ve glitches, interrupting programming, firess (ezUSB-0, ezUSB-1ezUSB-N) nis rebooted or when the USB cable is connected. The USB cable even after installing the ooting, click here B hiever Installation Guile.
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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. LSC ispYM(R) System - (Project is
- 8. On the Device Information screen click Select.

Device Information	on 🔰	<
Part Description:	<u></u> <u>_</u> K	
Device:	<u>C</u> ancel	
Select 114A5-64/32	<u>A</u> dvanced	1
Device Full Name:	Package:	
M4A5-64/32-XXVC48	48-pin TQFP	
Data File:		
Browse		
Instruction Register Length:		
Import 6	I Re-initialize Part on Program Error Enable Debug Mode	
Operation:	-	
Erase, Program, Verify	- Expand	1

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

> **Device Family – MACH4A** Device - iM4A5-64/32 Package Type - 48-pin TQFP

Select Device		×
Device Family	Device	
MACH4A	iM4A5-64/32	<u></u> K
ispLSI 1000	M4A3-32/32	
ispLSI 1000E	iM4A5-32/32	
ispLSI 1000EA	iM4A3-64/32	
ispLSI 2000A	iM4A5-64/32	
ispLSI 2000E	iM4A3-64/64	
ispLSI 2000VE	iM4A3-96/48	
ispLSI 3000	iM4A5-96/48	
ispLSI 5000VE	iM4A3-128/64	
MACH4A	iM4A5-128/64	•
MACH5	Package Type	
MACH5/1		
MACH5LV		
ispCLOCK	44-pin PLCC	
ispPAC Power Manager II	 44-pin TQFP 	Advanced >>
	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**.

Look jn: 📔	CPLD ·	- 🗧 🖆 📰 🔻
80418	_Oc.jed	

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.

Part Description:	<u></u> K
Device:	Cancel
Select iM4A5-64/32	Advanced
Device Full Name: M4A5-64/32-XXVC48	Package: 48-pin TQFP
Data File:	PLD\80418_0c.jed
Instruction Register Length:	 Re-initialize Part on Program Error Enable Debug Mode
Operation: Erase Program Verify	Funand

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.

LS	LSC ispVM(R) System - Chain configuration1*						
Eile Edit View Project ispIools Optid							
و چ	۵ 🔒 🍓 ا	6 🗈 🖻 💊 🦘 🦄					
🐨 Cł	Chain configuration 1						
Index	Device List	FileName/IR-Length	Operation	Status			
	iM4A5-64/32	C:\Safetran\CPLD\80418_0c.jed	Erase, Program, Verify	N/A			

6

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

Processing	Ple
88:88:88	Abort

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 recalibrated 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.

Location Name/AAR-DOT#:						
MP/Subdivision:						
SIDE	траск	BEF	ORE	AF	ſER	
SIDE	TRACK	EZ	EX	EZ	EX	
MAIN	1					
	2					
	3					
	4					
	5					
	6					
STBY	1					
	2					
	3					
	4					
	5					
	6					

Record GCP 4000 EZ/EX Operating Values