TEC2 CCM Programming Instructions

Using RS-485 UART Probe and STC Pins 36 and 38



BETTIS

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Section 1: TEC2 CCM Programming Instructions

1.1 Using RS-485 UART Probe and STC Pins 36 and 38



Figure 1 RS485 Setup

- 1. Connect USB cable to the RS485 Adapter and plug the other end of the cable into the USB port on the computer. See Figure 1.
- 2. Connect a two lead cable to the Phoenix connector. See Figure 2.



Figure 2 RS485 Adapter Box Connection

3. Connect RS485 cable to STC pins 36 and 38. See Figure 3.



Figure 3 STC Pins 36 and 38

4. Set all switches on the RS485 Adapter box to ON. See Figure 4.



Figure 4 Adapter Switch Settings

5. Go to Windows Control Panel and open device manager. See Figure 5.

~			
Control Panel > All Control	ol Panel Items 🔸		- 47 Search Control Panel
Adjust your computer's settings		Open	View by: Large icons 🔻
Action Center	Administrative Tools	AutoPlay	Backup and Restore
Color Management	Credential Manager	Date and time	Default Programs
Dell Client System Update	Desktop Gadgets	Device Manager	Devices and Printers
Display	Ease of Access Center	🖌 Flash Player	Folder Options
A Fonts	Getting Started	📢 HomeGroup	🥪 Indexing Options
Intel(R) Graphics and Media	1 Internet Options	Java	Keyboard
Location and Other Sensors	Mail	J Mouse	Network and Sharing Center
Notification Area Icons	Performance Information and Tools	Personalization	Phone and Modem
Power Options	Programs and Features	QuickTime	Realtek HD Audio Manager
Recovery	Region and Language	RemoteApp and Desktop Connections	Sound
Speech Recognition	Sync Center	system	Taskbar and Start Menu
Troubleshooting	User Accounts	Windows Anytime Upgrade	Windows CardSpace
Windows Defender	Windows Firewall	Windows Update	

Figure 5 Windows Control Panel

6. Determine the RS485 Adapter box Com Port Number. See Figure 6.



Figure 6 Com Port Number

7. Open the TEC-Flash.exe program. See Figure 7.



Figure 7 TEC-Flash.exe Icon

8. Select the correct Comm port and then select Open. See Figure 8.

Discover CCM Advanced Step 1: Open Comm Pot Scan Ports	1. Select correct Comm	
Open Cose Not com. Step 2: Modbus Slave Address Default 1 Address Scan Range	2. Click Open	
First 1 Last 5 Discover	Step 4: Download Devices 4a: Go to CCM Tab 4b: Go to LDM Tab	Step 5: Close Comm Port
Not Complete	4d: Go to RDM2 Tab	Not Complete

Figure 8 Open Comm Port

9. Enter the Modbus Address. Click on Discover. Select Check box for the Actuator, then click on the CCM Tab. See Figure 9.

	Step 3: Select Device	
Scan Ports	Address:001 ID:45ff451 MODEL:1234	3. Select device
COM2 -	Address:002 No Response	
	Address:004 No Response	
Open Close	Address:UU5 No Response	
Complete		
Step 2: Modbus Slave Address	 Enter Modbus Addre 	ess
Default 1 🔶		
Address Scan Range		
	2. Click Discover	Clear
First 1		
First 1 Last 5	Step 4: Download Devices	Step 5: Close Comm Port
First 1 Last 5	Step 4: Download Devices 4a: Go to CCM Tab	Step 5: Close Comm Port
First 1 Last 5 Discover	Step 4: Download Devices 4a: Go to CCM Tab 4b: Go to LDM Tab	Step 5: Close Comm Port
First 1 Last 5 Discover	Step 4: Download Devices 4a: Go to CCM Tab 4b: Go to LDM Tab 4c: Go to RDM1 Tab	Step 5: Close Comm Port Close Not Complete

Figure 9 TEC-Flash Program Discover Tab

10. On the CCM tab, click Read Version button on Step 1. Then Click Read CRC on Step 2. Then click Open File on Step 3. See Figure 10.

Step	1: Read Version	Step	2: Rea	d CRC	-	Step 3:	Open and Verify	Program		- Step 4: Start Bootloader -
	Read Version		В	ead CRC	;		Open	Hile		Auto Static
Btldr	Apr 1 2015, 10:20:49		Stored	Calc	P/F	120001	Version	Stored Ca	alc P/F	115200
Арр	Apr 2 2015, 12:49:22	Btldr	3364	3364	Pass	Btidr				
Mode	Application	App	e4b7	e4b7	Pass	Арр				Start Bootloader
Upi	grade Application	Upgrad	de Bootl	oader	Btldr (App (Mode (Verify Ve	rsion	Step 8. Verify Verfiy Stored C Btldr	CRC	Start Application
	Not Complete	No	t Comple	ete		Not Com	plete	Not Cor	nplete	Not Complete

Figure 10 Perform Steps 1 and 2 then click Open File

11. Navigate to the directory that holds the BIN file you want to download. Select that file and click open. See Figure 11.

					• •	
Favorites	A Name	Date modified	Туре	Size		
E Desktop	o ccm_FLASH.bin	4/29/2015 9:06 AM	VLC media file (.bi	504 KB		
📕 Downloads						
📤 Google Drive						
E Recent Places	= 1.	Select Bin file to				
	de	ownload				
Libraries						
Documents	_					
J Music						
Pictures						
Subversion						
Videos						
		Clic	Open			
Computer			open			
Ucomputer Solution (C:)						
Computer OS (C:) ExternWD160 (F:)						

Figure 11 Open BIN File

12. Figure 12 below shows that in Step 2 box, the CRC values of the code in the existing board "Stored" is the CRC in the code. Calc is the CRC that TEC-Flash calculated for the code on the board. In the Step 3 box, the Stored is the CRC for the new file that is stored in the new BIN file itself. Calc is the value of the CRC that the TEC-Flash.exe program calculated for the BIN file you selected to download. The Btldr = Bootloader and App = the Target executable file. See Figure 12.



Figure 12 Screen Showing that Target executable and New File to Download are different.

13. After the bootloader has started, you should see "Firmware Upgrade in Progress" on the LDM. See Figure 13. You should see that Step 4, Start Bootloader now shows Complete in Green and that Step 5 is now enabled to Upgrade Application. See Figure 14.

liscove	r CCM Advanced	0 2.0			0	2.0	1)/		-	bootloade	er
Step	Read Version	Step 2: N	Read CRC	С	Step	3: Upen an	Open File	am		running	late
Btldr	Apr 1 2015, 10:20:49	Store	ed Calc	P/F		Vers	ion	Stored	Calc	P/F	Auto Static
Арр	Apr 2 2015, 12:49:22	Btldr 3364	3364	Pass	Btidr	Apr 1 2015	, 10:20:49	3364	3364	Pass	
Mode	Application	App e4b7	e4b7	Pass	Арр	Apr 29 201	5, 09:06:30	6d0b	6d0b	Pass	Start Bootloader
loade correc	d file version is ct before upgrading.	allowed.	iot.	Btldr			Btldr	Stored	Calc	P/F	
Upi	grade Application	Upgrade Bo	otloader ete	Mode	Not (Complete	B	ooltlo ot be his ver	ader o en cha rsion, s	ode has nged in so you	Not Complete
		1 U	Click pgrade			Abort		an no	t uowi	iloau it	

Figure 13 Bootloader Running



Figure 14 Upgrade in Progress

14. You should now see the Step 5 "In Progress" and the green download status bar. See Figure 15.

Figure 15 Download in Progress. Takes 5 to 6 minutes to finish with wired connection.

Step	1: Read Version	Step	2: Rea	ad CRC		Step	3:0	pen and \	/erify Prog	gram			Step 4: Start Bootloader
	Read Version		F	lead CR	C				Open File	э			Baud Rate
Btldr	Apr 1 2015, 10:20:49		Stored	Calc	P/F			Version	1	Stored	Calc	P/F	115200
Арр	Apr 2 2015, 12:49:22	Btldr	3364	3364	Pass	Btldr	Apr	1 2015, 1	0:20:49	3364	3364	Pass	115200 +
Mode	Application	Арр	e4b7	e4b7	Pass	Арр	Apr	29 2015, (9:06:30	6d0b	6d0b	Pass	Start Bootloader
Step ! Read Pleas loade correc	5: Upgrade App y to upgrade. e ensure the d file version is ct before upgrading.	Step 6: U CCM Boo date. Re allowed.	pgrade otloader load not	Btldr up-to- t	Step 7	: Verify ' Verify	Versio	ion	Ste Btldr	ve Stored	y CRC nfiy CRC Calc	P/F	Step 9: Start Application
	In Progress		Complete	e	Mode	Not (Comp	ete		Not	Complet	te	Not Complete

15. When the Download has completed, you can now perform Steps 7, 8 and 9. Step 9 restarts the actuator code and should now be running the new code you just downloaded. See Figures 16 and 17.

Figure 16 Start Application

Step 1:	Read Version	Step 2: Read CRC	Step 3: Open and Verify Program	Step 4: Start Bootloader Baud Rate
Btldr A App A Mode A	pr 1 2015, 10:20:49 pr 2 2015, 12:49:22 pplication	Stored Calc Btldr 3364 3364 1 App e4b7 e4b7 ra	Ve Stor Btldr Apr 1 20 2 3364 App Apr 29 2019, 09.00 30 6d0k	y red Calc P 4 3364 Pa 5 6d0b Pass Static Static ® Static 115200 ↓ Static ® Static 115200 ↓
Step 5: Ready t Please loaded f correct	Complete Upgrade App to upgrade. ensure the file version is before upgrading.	Complete Step 6: Upgrade Btldr CCM Bootloader up to- date. Reload not allowed.	Comp. te Step 7: Verify Version Step 8: V Verify Version Step 8: V Btldr Apr 1 2015, 10:20:49 Stol App Apr 29 2015, 09:06:30	Verfly CRC Step 9: Start Application Verfly CRC Start Application red Calc P/F 4 3364 Pass
Upgra	ade Application	Upgrade Bootloader	Mode BootLoader App 6d0	Complete Not Complete



Step	1: Read Version	Step	2: Rea	d CRC		Step	3: Open and	Verify Prog	gram			Step 4: Start Bootloader
	Read Version		R	ead CR	c]		[Open File	ə			Baud Rate
Btldr	Apr 1 2015, 10:20:49		Stored	Calc	P/F		Versi	on	Stored	Calc	P/F	Auto Static
Арр	Apr 2 2015, 12:49:22	Btldr	3364	3364	Pass	Btldr	Apr 1 2015,	10:20:49	3364	3364	Pass	115200 -
Mode	Application	Арр	e4b7	e4b7	Pass	Арр	Apr 29 2015	, 09:06:30	6d0b	6d0b	Pass	Start Bootloader
0	Complete		C (Complete		7 1 4 1		Compl	ete	0.000		Complete
Step :	v to upgrade App	CCM Bo		Btidr	Step	/: Venty	Version	Ste	p 8: Vent		-	Step 9: Start Application
Pleas	e ensure the d file version is	date. Re	load not	up to		veni	version		Ve	C-l-	- D/F	Statt Application
correc	ct before upgrading.	ano rrou.			Btldr	Apr 12	015, 10:20:49	Btldr	3364	3364	Pass	
Up	grade Application	Upgra	de Boot	loader	App Mode	Apr 29 2 BootLoa	015, 09:06:30 der	Арр	6d0b	6d0b	Pass	
	Complete		Complete	э		Co	mplete		C	omplete		Passed

16. The code in the Actuator should now be running and the version should be the new version that you downloaded.

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