4. Application Programming

4.3 Executing an Application

The installed application will begin executing right after it is loaded into the target MCU of the STK500, right after the board is powered on, or right after the RESET button is pushed. The most important operations performed by an AVR application are typically written within an infinite loop nested in its main function, which is the case for both sample projects provided in Appendix section A.2. Therefore, these operations should run continuously while the board is powered on.

It is imperative to remember that the functionality of the board with respect to its application software is dependent on the hardware setup (e.g. if PORTA is programmed to control the switches, then a 10-wire cable must properly connect the PORTA header to the SWITCHES header). Appendix section A.3, Troubleshooting, addresses how to resolve some of the common issues encountered that would cause the board to not respond as desired with respect to the installed application.

The following set of instructions provides how to check whether the sample programs in Appendix sections A.2.1 and A.2.2.1 are running properly on the STK500 PCB.

4.3.1 Open the HyperTerminal program by going to "Start", "All Programs","Accessories", "Communications", and selecting "HyperTerminal" as seen in Figure4.28. If this is the first time HyperTerminal is used, enter an area code and follow the on-screen instructions given by the HyperTerminal program. Click "OK" to proceed.

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	🚯 Microsoft Update		
	Set Program Access and Defaults		
S 20	1 Windows Catalog		
My Computer Microsoft Visual Stu		Conscibility	
	Administrative Tools		HuperTerminal
	Administrative roots	Estartainment	
My Network NI ELVIS		Custom Taola	Mehwerk Connections
Places Traditional		System Tools	Network Connections
		Caludatan	
	Marcas ft Developer Network	Calculator	Wiseless Network Setup Wigard
Recycle Bin Remote Desktop		Command Prompt	Security Wizard
	Microsoft SOL Server 2005	Mulepau Mulepau	a la companya da serie de la companya de la company
Internet Shortcut to Explorer CEN 3213	Microsoft SQL Server 2005	Paint Paint Paint Paint	
	Microsoft Visual Studio 2006	Program Compatibility wizard Compatibility wizard	
	Microsoft Windows SDK V6.0A	Contraction	
A 27	National Instruments		
MATLAR 7.1 Shouteut to	PL-2303 USB-Serial Driver	3 Tour windows XP	
Administr	PowerISO	windows Explorer	
	Startup	WordPad	
	Symantec Client Security	Scanner and Camera Wizard	
🙆 Internet	WinAVR-20090313 ■		
1 Internet Explorer	Windows PowerShell 1.0		
E-mail	WINRAR F		
	WinSCP •		
Microsoft Update	Acrobat Distiller 9		
<u> </u>	Acrobat.com		
CV CodeVisionAVR C Co	Adobe Acrobat 9 Pro		
(m)	LC Adobe LiveCycle Designer ES 8.2		
Notepad	Adobe Reader 9		
	C Internet Explorer		
Visual Stud	MSN		
	National Instruments LabVIEW 8.6		
	Outlook Express		
WinSCP	Remote Assistance		
	Windows Media Player		
Microsoft Office Wor	windows Messenger		
	Windows Movie Maker		
	windows search		and the second second
	Log Off 🚺 Turn Off Computer		
🦺 start 🌖 🕑 🏉			

Figure 4.28 Screenshot of how to start a HyperTerminal session.

4.3.2 Type a Name for the HyperTerminal session, say "com3_STK500_DAQ", and select an Icon within the "Connection Description" window as shown in Figure 4.29. Click "OK" to proceed.



Figure 4.29 Screenshot of the Connection Description window used by HyperTerminal to establish a new connection.

4.3.3 Choose the appropriate COM port to which the STK500 is connected. The example in Figure 4.30 shows COM3 is used, but this can be different on another computer. The Troubleshooting section in Appendix A.3 explains how to determine which port is being used by the STK500.

Connect To	? 🔀
🥳 com3_S	TK500_DAQ
Enter details for	the phone number that you want to dial:
Country/region:	United States (1)
Area code:	239
Phone number:	
Connect using:	сомз 🗸
	OK Cancel

Figure 4.30 Screenshot of the Connect To window that HyperTerminal uses to establish at which COM port to receive or send data.

4.3.4 Select the appropriate COM properties to match the requirements given by the program uploaded to the target MCU (the ATmega8515L in this case). These settings

should match those given by Figure 4.31 for this example. Click "OK" to proceed. If an error occurs at this point, refer to Troubleshooting section A.3 of the appendix.

Port Settings		
Bits per second:	115200	~
Data bits:	8	~
Parity:	None	~
Stop bits:	1	~
Flow control:	None	~
	Res	tore Defaults
0	K Cancel	



4.3.5 Push the RESET button on the STK500 board shown in Figure 4.32 to restart the program installed in the flash memory of the ATmega8515L. Now push one of the push-button switches. The results from these actions should yield a HyperTerminal window that looks like the one in Figure 4.33. If the results are not correct or seem to be garbled, refer to Troubleshooting section A.3 of the appendix; the firmware might need to be updated [16].

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Figure 4.32 Picture emphasizing the RESET button on the STK500 evaluation board.



Figure 4.33 From left to right: a screenshot of a HyperTerminal session with respect to the test application for USART communication; a screenshot of a HyperTerminal session with respect to the myTWI-to-STK500 DAQ application.

4.3.6 Click on the X in the top-right corner of the HyperTerminal window as shown in the Figure 4.33 screenshots to exit the HyperTerminal program. Two pop-up windows will follow: the first shown in Figure 4.34 confirms whether you want to exit HyperTerminal (click "Yes" to proceed with exiting), and the second shown in Figure 4.35 asks whether you want to save the current HyperTerminal session (click "Yes" to save the session and then exit or click "No" to just exit).



Figure 4.34 Screenshot of the HyperTerminal pop-up window that appears when an attempt has been made to exit a HyperTerminal session.



Figure 4.35 Screenshot of the HyperTerminal pop-up window that appears when an exiting an unsaved HyperTerminal session.

This concludes how to execute the test application for USART communication and the myTWI-to-STK500 DAQ application. Appendix section A.3, Troubleshooting, covers some of the common errors that arise while carrying out the instructions provided in this section.

Try editing the code used in this section to have one push-button switch correspond to one LED (say SW3 with LED3) where the LED will turn on or off when this button is pushed. Then try adding some code that will send a message to the host via USART when a different button is pushed, say SW7. It is important to know that PA3 controls SW3 and that PA7 controls SW7 since PORTA is connected to the SWITCHES header. Similarly, PC3 controls LED3 since PORTC is connected to the LEDS header. Also note from the provided sample programs in Appendix section A.2 that a carriage return ("\r") must be sent when starting a new line ("\n") in HyperTerminal; otherwise, the data sent will be skewed.