

Progress Report 1
Design Team 7
17 March 2010

Project Summary

This project will determine the integrity of an Ethernet line. The integrity of the line will be determined by running a series of tests on the TLK100. The IC will send the data to a development board with a touch screen. The development board will act as a MAC layer interface for the PHY layer TLK100 and the color-touch screen will provide a graphical user interface (GUI) for the user.

The device will be powered by Power-over-Ethernet (PoE), unless it is unavailable. In this case, a wall adapter or rechargeable, back-up Li-Ion batteries will be used.

TI Involvement

Sponsoring our project is Texas Instruments (TI). Our device is to determine integrity by testing Time Domain Reflectometry (TDR), Active Link Cable Diagnostics (ALCD), and Digital Spectrum Analysis (DSA) using the TLK100 TI integrated circuit. The results will be displayed on a color-touch screen using a ARM Cortex M3 microprocessor. The device is to be powered by three source options integrating Power-over-Ethernet technology.

Tasks

After meeting with our sponsor we immediately began researching background information on all aspects of our project, especially the integrity checks. We realized that all the tasks can be completed with the use of the TLK100. In order to connect the TLK100 with our development board we have to use Media Independent Interface (MII) a technology that links the PHY layer with the MAC layer. The MII is a 40-pin Mini-D link port size and finding a part that would implement this was difficult. We found that if the TLK100 Evaluation Module is used, we can find a part that would attach to the evaluation module and split the MII into separate usable wires. We have received the TLK100EVM; we are waiting for the MII connector in order to begin implementation. We have, however, begun to figure out how we intend to map the MII ports to the microprocessor.

Our DK-LM3S9B96 Development Kit will supply the Cortex M3 microprocessor and the touch screen. This has been ordered, however we are still waiting for it to be received. In order to program the microcontroller we have chosen to use the IAR workbench which will allow us to program the microprocessor in C++. We have also studied sample code in order to ease the learning curve for the programming of the microchips.

In order to implement PoE technology we ordered the TPS2376-H. This will allow us to use voltage supplied by the Ethernet line to power our device. When PoE is unavailable, we intend to use the BQ24071 TI part, however this part only comes in QFN size, too

small to be mounted on anything here at MSU. The part would have cost \$215 to get mounted offsite. In order to save budget money we have decided on a similar chip, the MCP73862 by Microchip, this is a very similar part that comes in a usable size. This part will be able to regulate between a wall adapter and Li-Ion batteries as well as recharge the batteries while on adapter power. We have decided to OR the power from the MCP73862 and the TPS2376-H with a diode to give priority to PoE, the higher voltage. The resulting voltage will then be stepped down using a buck converter to 5 volts in order to power the device at the right voltage. The TPS has been received and mounted; we are waiting on the MCP in order to begin construction. We have however, began to figure out what resistors, capacitors, diodes, and magnetics will be needed in developing the circuit.

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Problems Encountered

We have had trouble getting our Development Kit. This is an integral part of the project and can't do much implementation without it. We are also unable to determine if our current design will work. This gets risky as we are now down to 5 weeks left in the semester.

We have also had trouble with small parts needed to be mounted. As stated earlier we are not able to use the BQ24071 because it is too small. Luckily we were able to find a comparable part that will do all necessary tasks.

Budget Analysis

Part	Price	Quantity	Supplier
Development Board	Provided by TI	3	TI
TLK100	Provided by TI	3	TI
TPS2376-H (PoE)	Provided by TI	3	TI
BQ24071	Provided by TI	3	TI
MCP73861	\$2.75	3	Microchip
RJ-45 Port/Magnetics	\$3.00	3	Pulse
MII Board	\$59	1	
POE Injector	\$46.94	1	TRENDnet
SchmartBoard	\$25.99	1	SchmartBoard
TVS Diodes	\$.30	10	Littelfuse
Total	\$152.18		

Gantt Chart

		Task Name	Duration	Start	Finish	Predecessors	Resource Names
1	✓	Introduction to Project	9 days	Mon 1/11/10	Thu 1/21/10		
2	✓	Meet with Team	1 day	Mon 1/11/10	Mon 1/11/10		
3	✓	Receive Project Description	1 day	Tue 1/12/10	Tue 1/12/10		
4	✓	Research Project Description	5 days	Tue 1/12/10	Mon 1/18/10		
5	✓	Meet with Facilitator	1 day	Fri 1/15/10	Fri 1/15/10		
6	✓	Contact TI	3 days	Mon 1/18/10	Wed 1/20/10	5	
7	✓	Conference Call with TI	1 day	Thu 1/21/10	Thu 1/21/10	6	
8	✓	Pre-Proposal	23 days?	Wed 1/20/10	Fri 2/19/10		
9	✓	Pre-Proposal Assigned	1 day	Wed 1/20/10	Wed 1/20/10		
10	✓	Meet to Discuss Pre-Proposal	1 day	Mon 1/25/10	Mon 1/25/10		
11	✓	Pre-Proposal	1 day	Thu 2/4/10	Thu 2/4/10		
12	✓	Request Parts	1 day	Mon 1/25/10	Mon 1/25/10	7	
13	✓	Final Proposal	11 days?	Fri 2/5/10	Fri 2/19/10	11	
14	✓	Do FastTrack	1 day	Fri 2/12/10	Fri 2/12/10		
15	✓	Feasibility Matrix	1 day	Fri 2/5/10	Fri 2/5/10		
16	✓	Solution Selection Matrix	1 day	Fri 2/5/10	Fri 2/5/10		
17	✓	Make Edits	1 day?	Mon 2/8/10	Mon 2/8/10		
18	✓	Final Proposal	5 days?	Mon 2/15/10	Fri 2/19/10		
19	✓	Receive Parts	23 days?	Mon 2/15/10	Wed 3/17/10		
20	✓	Receive Development kit	17 days?	Tue 2/23/10	Wed 3/17/10	12	
21	✓	Receive other parts	1 day?	Mon 2/15/10	Mon 2/15/10	12	
22		Prototyping	14 days	Thu 3/18/10	Tue 4/6/10		
23		Develop Touch Display GUI	4 days	Thu 3/18/10	Tue 3/23/10	20	Andy,Brian,Mark
24		Program TLK100 Integrity Checks	4 days	Thu 3/18/10	Tue 3/23/10	20	Andy,Brian,Mark
25		Implement AC Adaptor	5 days	Thu 3/18/10	Wed 3/24/10	20	Ahmed,Brian,Sedat
26		Implement Power Source ORing	7 days	Thu 3/25/10	Fri 4/2/10	25	Ahmed,Brian,Sedat
27		Connect TLK100 with Dev Kit	6 days	Wed 3/24/10	Wed 3/31/10	24,23	Andy,Brian,Sedat
28		Slack Time	2 days	Mon 4/5/10	Tue 4/6/10	27,26	
29		First Demo	2 days?	Tue 3/23/10	Wed 3/24/10		
30	✓	Progress Report 1	11 days	Fri 3/5/10	Fri 3/19/10		
31		Prototyping continued	12 days?	Wed 4/7/10	Thu 4/22/10	28	
32		Develop passive mode	7 days	Wed 4/7/10	Thu 4/15/10		Andy,Mark
33		Connect Dev Board with Power so	4 days	Wed 4/7/10	Mon 4/12/10		Ahmed,Sedat,Brian
34		Save results to SD card	3 days	Fri 4/16/10	Tue 4/20/10	32	Andy,Mark
35		Slack Time	1 day	Wed 4/21/10	Wed 4/21/10	34,33	
36		Second Demo	1 day?	Thu 4/22/10	Thu 4/22/10	35	
37		Progress Report 2	7 days	Thu 4/22/10	Fri 4/30/10		
38		Design Issues Paper	7 days	Tue 4/6/10	Wed 4/14/10		
39		Finalizing Project	5 days?	Fri 4/23/10	Thu 4/29/10	36	
40		Make Handheld as possible	1 day?	Fri 4/23/10	Fri 4/23/10		
41		Slack Time	5 days	Fri 4/23/10	Thu 4/29/10		
42		Poster	14 days	Fri 4/9/10	Wed 4/28/10		
43		Design Day	1 day?	Fri 4/30/10	Fri 4/30/10	41	