



Gigabit Ethernet Consortium

Clause 40 Auto-Negotiation Auto-Crossover Test Suite v2.1 Report

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Enclosed are the results from the Clause 40 Auto-Negotiation Auto-Crossover Conformance testing performed on:

Device Under Test (DUT):	Computer HBL 5487 NIC
Hardware Version:	N/A
Firmware Version:	N/A
Software Version:	201
Miscellaneous:	PHY: Int LCS65; Magnetics: BET 06N S7842-5794-G4

The test suite referenced in this report is available at the UNH-IOL website:

ftp://ftp.iol.unh.edu/pub/ethernet/test_suites/CL40_AUTOCROSS/Auto_Crossover_Test_Suite_v2.1.pdf

Issues Observed While Testing

40.1.4 – Range of A_timer: The DUT was observed to improperly implement it's a_timer.

For specific details regarding issues please see the corresponding test result.

Testing Completed 07/27/2006

Review Completed 07/27/2006

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Result Key

The following table contains possible results and their meanings:

Result	Interpretation
PASS	The Device Under Test (DUT) was observed to exhibit conformant behavior.
PASS with Comments	The DUT was observed to exhibit conformant behavior however an additional explanation of the situation is included, such as due to time limitations only a portion of the testing was performed.
FAIL	The DUT was observed to exhibit non-conformant behavior.
Warning	The DUT was observed to exhibit behavior that is not recommended.
Informative	Results are for informative purposes only and are not judged on a pass or fail basis.
Refer to Comments	From the observations, a valid pass or fail could not be determined. An additional explanation of the situation is included.
Not Applicable	The DUT does not support the technology required to perform these tests.
Not Available	Due to testing station or time limitations, the tests could not be performed.
Borderline	The observed values of the specified parameters are valid at one extreme, and invalid at the other.
Not Tested	Not tested due to the time constraints of the test period.

Test Setup

All tests were completed using the UNH-IOL created Python Board. This board allows us to view signaling transmitted and received before establishing a link, along with viewing the type of link signaling a device is transmitting. Some of our testing tools can be viewed at: <http://www.iol.unh.edu/consortiums/ethernet/tools/aneg/> Some tests required the use of specific Spirent SmartBits cards to establish a link and send packets.



GROUP 1: CLAUSE 40 AUTO-CROSSOVER FUNCTION REQUIREMENTS

Test # and Label	Part(s)	Result(s)
40.1.1 – Setting and Resetting of Link_Det with Auto-Negotiation Enabled	a	PASS
	b	PASS
	c	PASS
	d	PASS
	e	PASS
	f	PASS
Expected Results and Procedural Comments		
<p>Purpose: To verify that the device under test properly sets, resets, and keeps Link_Det=True when Auto-Negotiation is enabled.</p> <p>a. The DUT is sent a series of FLPs, with alternating content, to set Link_Det=TRUE on a specific channel. The DUT should transmit FLPs on the opposite channel until the cessation of FLP transmission from the Link Partner. Both channels are tested.</p> <p>b. The DUT is sent a series of FLPs, with consistent content, to set Link_Det=TRUE on a specific channel. The DUT should transmit FLPs on the opposite channel until the cessation of FLP transmission from the Link Partner. Both channels are tested.</p> <p>c. The DUT is sent a series of FLPs, with consistent content and the Acknowledge bit set, to set Link_Det=TRUE on a specific channel. The DUT should transmit FLPs on the opposite channel until ack_finished=TRUE, at which time the DUT should commence transmitting link signaling on the same channel. Both channels are tested.</p> <p>d. The DUT is sent a series of FLPs with the Acknowledge and Next Page bits set to one to set Link_Det=TRUE on a specific channel. The DUT should transmit its first Next Page on the opposite channel until the cessation of FLP transmission from the Link Partner. Both channels are tested.</p> <p>e. The DUT is sent 10BASE-T link signaling to set Link_Det=TRUE on a specific channel. The DUT should transmit 10BASE-T link signaling on the opposite channel until the cessation of 10BASE-T link signaling from the Link Partner. Both channels are tested.</p> <p>f. The DUT is sent 100BASE-TX link signaling to set Link_Det=TRUE on a specific channel. The DUT should transmit 100BASE-TX link signaling on the opposite channel until the cessation of 100BASE-TX link signaling from the Link Partner. Both channels are tested.</p>		
Comments on Test Results		
<p>a. The DUT was observed to properly transmit and remain on the opposite channel from which it was receiving.</p> <p>b. The DUT was observed to properly transmit and remain on the opposite channel from which it was receiving.</p> <p>c. The DUT was observed to properly transmit FLPs on the opposite channel from which it was receiving. Upon setting ack_finished=TRUE, the DUT was observed to properly commence link signaling transmission on the same channel.</p> <p>d. The DUT was observed to properly transmit and remain on the opposite channel from which it was receiving, cease transmissions for break_link_timer and resume the Auto-Crossover function.</p> <p>e. The DUT was observed to properly transmit and remain on the opposite channel from which it was receiving, cease transmissions for break_link_timer and resume the Auto-Crossover function.</p> <p>f. The DUT was observed to properly transmit and remain on the opposite channel from which it was receiving, cease transmissions for break_link_timer and resume the Auto-Crossover function.</p>		

Test # and Label	Part(s)	Result(s)
40.1.2 – Setting and Resetting of Link_Det with Auto-Negotiation Disabled	a	Informative
	b	Informative
Expected Results and Procedural Comments		
<p>Purpose: To verify that the device under test properly sets, resets, and keeps Link_Det=True when Auto-Negotiation is disabled.</p> <p>a. The DUT is sent 10BASE-T link signaling to set Link_Det=TRUE on a specific channel. The DUT should transmit 10BASE-T link signaling on the opposite channel until the cessation of 10BASE-T link signaling from the Link Partner. Both channels are tested.</p> <p>b. The DUT is sent 100BASE-TX link signaling to set Link_Det=TRUE on a specific channel. The DUT should transmit 100BASE-TX link signaling on the opposite channel until the cessation of 100BASE-TX link signaling from the Link Partner. Both channels are tested.</p>		
Comments on Test Results		
<p>a. INFORMATIVE: The DUT was observed to properly transmit and remain on the opposite channel from which it was receiving, cease transmissions for break_link_timer and resume the Auto-Crossover function.</p> <p>b. INFORMATIVE: The DUT was observed to properly transmit and remain on the opposite channel from which it was receiving, cease transmissions for break_link_timer and resume the Auto-Crossover function.</p>		

Test # and Label	Part(s)	Result(s)
40.1.3 – Range of sample_timer	a	PASS
	b	Informative
	c	PASS
Expected Results and Procedural Comments		
<p>Purpose: To verify that the device under test transmits FLPs on a specified channel for a time within sample_timer or a multiple of sample_timer.</p> <p>a. Transmissions from the DUT are observed in MDI mode. All observed values should fall in the range of 62 ± 2 ms.</p> <p>b. Transmissions from the DUT are observed in MDI-X mode. All observed values should fall in the range of 62 ± 2 ms., unless its A_timer expires forcing it back to MDI mode.</p> <p>c. Transmissions from the DUT are observed in both MDI and MDI-X modes. The DUT should transmit all multiples of sample_timer in both modes, up to eleven.</p>		
Comments on Test Results		
<p>a. The DUT was observed to transmit FLPs in MDI mode for $60.586 \text{ ms} \pm \text{transmit_link_burst_timer}$.</p> <p>b. INFORMATIVE: The DUT was observed to transmit FLPs in MDI-X mode for $62.439 \text{ ms} \pm \text{transmit_link_burst_timer}$ with exception of the times A_timer had expired forcing it back to MDI mode.</p> <p>c. The DUT was observed to properly transmit in MDI and MDI-X modes for all multiples of sample_timer.</p>		

Test # and Label	Part(s)	Result(s)
40.1.4 – Range of A_timer	a	FAIL
	b	PASS
Expected Results and Procedural Comments		
<p>Purpose: To verify that the device under test properly implements A_timer.</p> <p>a. Transmissions from the DUT are observed. The times between occurrences of the DUT transmitting on its MDI-X channel for less than sample_timer are recorded. These times should always be multiples of A_timer, 1300 ± 325 ms.</p> <p>b. Transmissions from the DUT are observed. While transmitting in MDI-X mode and the DUT receives A_timer_done=TRUE, the DUT should immediately switch to MDI mode, which would cause the DUT to transmit in MDI-X mode for less than a multiple of sample_timer. While transmitting in MDI mode, the DUT should always remain on the channel for a multiple of sample_timer.</p>		
Comments on Test Results		
<p>a. The DUT was observed to improperly restart its Auto-Crossover process every 1800 ms.</p> <p>b. The DUT was observed to properly establish A_timer_done=TRUE and restart the Auto-Crossover function.</p>		

Test # and Label	Part(s)	Result(s)
40.1.5 – Maximum Channel Transmit Time	a	PASS
	b	PASS
Expected Results and Procedural Comments		
<p>Purpose: To verify that the device under test transmits FLPs on a certain channel for less than the maximum of 704 milliseconds.</p> <p>a. Transmissions from the DUT are observed on the MDI channel of the DUT. The DUT should transmit FLPs in MDI mode for no more than 640 ms. However, if A_timer expires after the DUT transmits in MDI mode for approximately 640 ms, the DUT will continue to transmit in MDI mode for one more sample_timer before switching channels, which gives a maximum time of 704 ms.</p> <p>b. Transmissions from the DUT are observed on the MDI-X channel of the DUT. The DUT should transmit FLPs on a single channel for no more than 704 ms.</p>		
Comments on Test Results		
<p>a. The DUT was observed to transmit in MDI mode for no longer than 695.842 ms.</p> <p>b. The DUT was observed to transmit in MDI-X mode for no longer than 703.964 ms.</p>		