

**MK5025**  
**NET 2 CONFORMANCE****INTRODUCTION**

The MK5025 is a CMOS VLSI Link Level Controller which provides complete link level data communication control conforming to CCITT recommendation X.25. It also has additional features which allow it to support LAPD as well as X.32 and X.75. The MK5025 is currently in use in systems which have met conformance testing for Telenet, Tymenet, Datex-P, Iberpac, and DDN/DCA certification as well as approval for LAPD connection to AT&T and Norther Telecom ISDN. Most recently the MK5025 has undergone testing for conformance to NET 2.

NET 2 is a European technical recommendation that details the requirements (and interface tests for conformance to those requirements) of packet mode DTEs to dedicated circuit interfaces of X.25 public packet switched data networks (PSPDN). As of 30 June 1990, NET 2 became the applicable standard for X.25 interface in the majority of European countries.

**PURPOSE**

The current MK5025 can be implemented to meet the NET 2 requirements. The majority of the NET 2 tests can be met by the MK5025 using the standard LAPB operation and standard set of primitives. There are however some NET 2 tests that require the use of some options that were added to the revision C02 of the MK5025 which is the current production version. The purpose of this applications note is to list those tests and how they can be met using the MK5025.

**NET 2 TESTS**

The majority of NET 2 tests can be met by the MK5025 with very little intervention from the host other than the initial setup of MK5025 registers and memory data structures, reception and issuing of primitives for link set-up or disconnect, and transmission and reception of required I frames. There are however some tests that require intervention by the host to determine what action to take in the case of certain error conditions.

The following NET 2 tests are those that may require host intervention and use of special fea-

tures of the MK5025.

*Test 9.1.4 DTE Initiated DISC Start*

According to CCITT X.25, a DTE shall initiate link setup by polling with SABM/E, and the MK5025 does this in response to a Connect Request primitive issued by the host. However, once a Start primitive (writing 4100H to CSR1) has been issued to the MK5025, polling with DISC can be accomplished using another Start primitive, but with UPARAM=1 (5100H to CSR1), immediately followed by a Disconnect Request primitive (4E00 to CSR1). Then, following the reception of a Disconnect Confirmation provider primitive, a Connect Request primitive can be issued by the host to complete the remainder of the test (requiring the standard transmission of SABM/E).

*Test 9.5 Incorrect FCS*

The MK5025 will ignore frames with bad FCS regardless of their content, even if they are greater in length than N1. The MK5025 will also ignore frames with bad FCS that cross multiple buffer boundaries. However, if the length of the frame exceeds N1 and crosses one more buffer boundary, the MK5025 will then generate a FRMR with Y=1 (indicating receipt of a frame that exceeds N1), regardless of good or bad FCS. The reason for this is that if the MK5025 were to continue to allow reception of an excessively large frame into additional multiple buffers once the frame length exceeds N1, all available memory could be consumed by the frame without yet receiving the FCS to determine if it be good or bad.

NET 2 test 9.5.4 does not specify how much longer the "Extra long frame with incorrect FCS" can be beyond N1. To conform this test, when data chaining is used, the buffer size should be slightly smaller than an integer division of N1, so that when a frame exceeds N1 it will have a large amount of one buffer remaining (so as not to cross a buffer boundary after exceeding

N1, which would cause transmission of FRMR). If chaining is not desired then the buffer size should be sufficiently larger than N1 to accommodate the reception of the entire "extra long frame" in one buffer.

## APPLICATION NOTE

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### *Test 9.11 Miscellaneous Tests*

The test conditions in tests 9.11.2 and 9.11.3 cause the MK5025 to go into the Error Indication state. From this state the MK5025 Technical Manual recommends issuing either a Reset Request primitive (which will initiate link set-up by sending SABM/E) or a Disconnect Request primitive (which will initiate link disconnection by sending a DISC).

In the Error Indication state the MK5025 will ignore the reception of any frames other than SABM/E or DISC. NET 2 tests 9.11.2 & 3 imply that the unit under test go directly into disconnected phase upon receiving a DM or FRMR while in information transfer phase. To accomplish this the host must, in response to an Error Indication primitive, issue a Stop primitive immediately

followed by a Start primitive and then, if necessary, a Disconnect Request primitive to cause the MK5025 to send a DM (the alternate reaction for test 9.11.3). [Please note that this same reaction to Error Indication should be used in tests 9.7 if it is necessary to send the alternate reaction of DM/F=0 rather than SABM/P=1].

### **CONCLUSION**

Since the MK5025 is a Link Level controller, the Packet Level must be implemented in software and written to meet the packet level requirements of NET 2. However, using the techniques mentioned in this app brief, the MK5025 can be used to meet the Link Level requirements of NET 2 and applicable annexes.

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