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AMENDMENT 10
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Information technology — Telecommunications and information exchange between systems — High-level data link control (HDLC) procedures — Classes of procedures

AMENDMENT 10: Extension of HDLC sequence number modulus beyond 128

Technologies de l'information — Télécommunications et échange d'informations entre systèmes — Procédures de commande de liaison de données à haut niveau (HDLC) — Classes de procédures

AMENDEMENT 10: Extension du module du numéro de séquence HDLC au-delà de 128

Reference number
ISO/IEC 7809:1993/Amd.10:1995(E)

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Amendment 10 to International Standard ISO/IEC 7809:1993 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 6, *Telecommunications and information exchange between systems.*

Introduction

This amendment to ISO/IEC 7809:1993 increases the modulus number (i.e. the sequence number) in steps up to a maximum of 2 147 483 648 which can be represented in 31 bits. This is done by the introduction of a new "Set Mode" command that can be used to negotiate or indicate the modulus in absence of, or to override, a default value. This uses an optional information field in the "Set Mode" command.

This amendment adds details necessary in extending the modulus beyond 128 and also the introduction of the information field in the mode-setting commands/responses.

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Subclause 3.4

Table 1

Renumber option 10 as 10.1 and add the following:

10.2 Provides the ability to use extended sequence numbering (modulo 32 768) (not for UCC or BCC)	Use the SM command
10.3 Provides the ability to use extended sequence numbering (modulo 2 147 483 648) (Not for UCC or BCC)	Use the SM command
17 Provides the ability to set up a link	Use the Set Mode command in place of the corresponding frame from the basic repertoire (SXXM) or the associated extended frame (SXXME) to set up the link
18 Provides the ability to have an optional information field in the UA and DM response frames and the DISC command frame	Use the UA and DM responses and the DISC command with an optional information field
19 Provides the ability to have an optional information field in different mode setting commands from the basic repertoire (i.e., SABM, SARM, SNRM) or the alternative frame per optional function 10.1 (i.e., SABME, SARME and SNRME)	Use the corresponding mode setting command with an optional information field

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Subclause 3.4

Figure 5

Replace 10 as follows:

10	Extended sequence numbering
10.1	For extended sequence numbering, i.e., modulo 128 (not for UCC or BCC) Use extended control field format instead of basic control field format; use SXXME instead of SXXM.
10.2	For extended sequence numbering, i.e., modulo 32 768 (not for UCC or BCC) Use the SM command.
10.3	For extended sequence numbering, i.e., modulo 2 147 483 648 (not for UCC or BCC) Use the SM command.

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Subclause 3.4

Figure 5

Add the following:

17.	For link set-up using Set Mode Command Use the SM command in place of the corresponding frame from the basic repertoire (SXXM) or the associated extended frame (SXXME).
18.	To convey information during acceptance of a link set-up, in a DM response, and in the DISC command. Use the optional information field in the UA, DM response, and the DISC command.
19.	For link-set up using the set mode commands from the basic repertoire or the alternative frame per optional function 10.1. Use the mode setting commands (i.e., SABM, SNRM, SARM, SABME, SNRME, SARME) with optional information field.

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Subclause 5.4.1.4

Change the third sentence of the third paragraph to read as follows:

In case of contention between a SABM and a SABME or SM command, the combined station sending SABME or SM shall have priority over the combined station sending the SABM command in reattempting link establishment.

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Subclause 8.10

Insert heading for subclause 8.10.1 as indicated below immediately after 8.10:

8.10.1 Option 10.1 - extended sequence numbering - modulo 128 (not for UCC or BCC)

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Add a new subclause 8.10.2 and 8.10.3 as follows:

8.10.2 Option 10.2 - extended sequence numbering - modulo 32 768 (not for UCC or BCC)

The extended sequence numbering - modulo 32 768 optional function provides the mechanism for defining the sequence numbering for I frame transfer to be modulo 32 768. The mechanism is in the form of an SM command with an optional information field to indicate the modulo and the mode of the operation (i.e., the normal response mode (NRM) operation, the asynchronous response mode (ARM) operation, and the asynchronous balanced mode (ABM) operation). The send and receive sequence numbers in I frames are modulo 32 768. The receive sequence number in supervisory frames is modulo 32 768. The control field in I frames and supervisory frames is extended in length to 4 octets. The control field in unnumbered frames remains one octet in length.

8.10.3 Option 10.3 - extended sequence numbering - modulo 2 147 483 648 (not for UCC or BCC)

The extended sequence numbering - modulo 2 147 483 648 optional function provides the mechanism for defining the sequence numbering for I frame transfer to be modulo 2 147 483 648. The mechanism is in the form of an SM command with an optional information field to indicate the modulo and the mode of the operation (i.e., the normal response mode (NRM) operation, the asynchronous response mode (ARM) operation, and the asynchronous balanced mode (ABM) operation). The send and receive sequence numbers in I frames are modulo 2 147 483 648. The receive sequence number in supervisory frames is modulo 2 147 483 648. The control field in I frames and supervisory frames is extended in length to 8 octets. The control field in unnumbered frames remains one octet in length.

Typical applications for modulo 2 147 483 648 are: satellite operations (i.e., long propagation delay environments) and very high speed/heavy traffic load situations. The greater modulo value allows for larger send and receive windows to be defined so that information transfer performance can be improved in such situations.

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Subclause A.2

Change the third paragraph to read as follows:

The optional functions 2, 8, 10.1 are recapitulated in table A.2 (see also table 1).

Change Note 2 to table A.1 as follows:

2 BAC 2, 8, 10.1 is recommended in some cases.

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Change the title of table A.2 as follows:

Table A.2 - Optional functions 2, 8 and 10.1

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Subclause A.4.3.2

Change the title to read as follows:

Extended sequence numbering: TWS, point-to-point, BAC 2, 8, 10.1

Add a new subclause A.4.3.3 as follows:

A.4.3.3 Extended sequence numbering - modulo 2 147 683 484: TWS, point-to-point, BAC 3.2, 8, 10.3

Commands	Responses
I	
RR	RR
RNR	RNR
REJ	REJ
SM	UA
DISC	DM
	FRMR

This procedural subset is applicable in the same situations as the non-extended one when very high performance is needed on data links with specific characteristics, such as high bandwidth and long delay.

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