INTERNATIONAL STANDARD

# ISO/IEC 7809

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

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




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# 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.

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

This third edition cancels and replaces the second edition (ISO/IEC 7809:1991), and incorporates ISO/IEC 7809 amendments 5, 6 and 7.

Annex A of this International Standard is for information only.

# Introduction

High-level data link control (HDLC) classes of procedures describe methods of data link operation which permit synchronous or start/stop, code-transparent data transmission between data stations in a variety of logical and physical configurations. The classes are defined in a consistent manner within the framework of an overall HDLC architecture. One of the purposes of this International Standard is to maintain maximum compatibility between the basic types of procedures, unbalanced, balanced and connectionless, as this is particularly desirable for data stations with configurable capability, which may have the characteristics of a primary, secondary, combined, control, tributary, or peer station, as required for a specific connection.

This International Standard defines five fundamental classes of procedures (two unbalanced, one balanced, and two connectionless). The unbalanced classes apply to both point-to-point and multipoint configurations (as illustrated in figure 1) over either dedicated or switched data transmission facilities. A characteristic of the unbalanced classes is the existence of a single primary station at one end of the data link plus one or more secondary stations at the other end(s) of the data link. The primary station alone is responsible for data link management, hence the designation "unbalanced" classes of procedures.

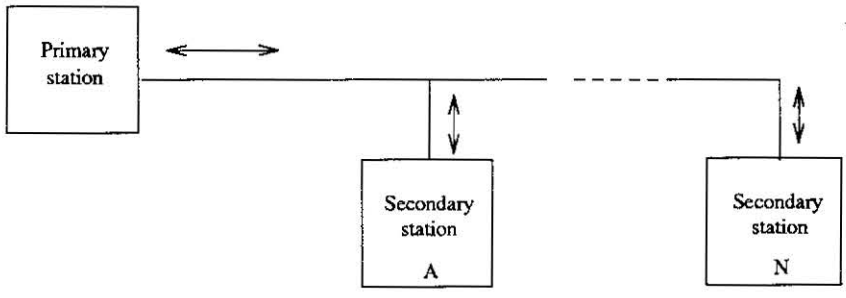



**Figure 1 - Unbalanced data link configuration**

The balanced class applies to point-to-point configurations (as illustrated in figure 2) over either dedicated or switched data transmission facilities. A characteristic of the balanced class is the existence of two data stations, called combined stations, on a logical data link, that may share equally in the responsibility for data link management, hence the designation "balanced" class of procedures.

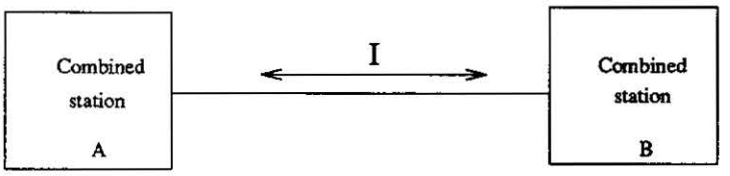



**Figure 2 - Balanced data link configuration**

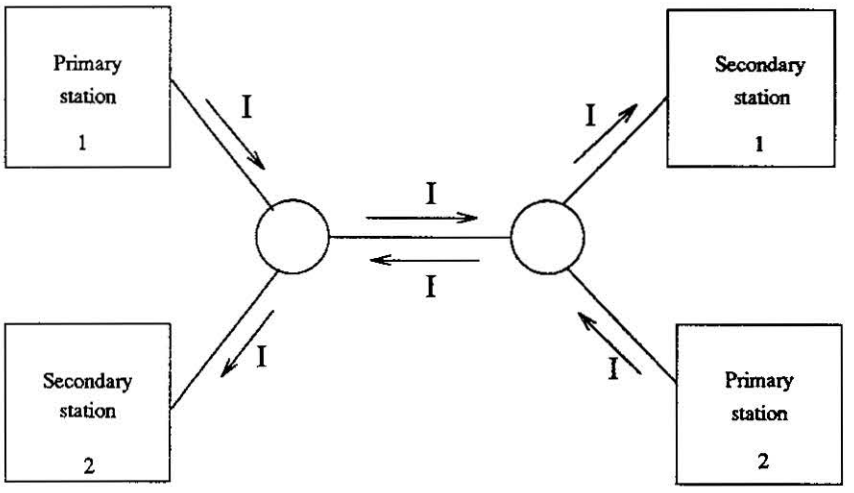



**Figure 3 - Symmetrical data link configuration**

The unbalanced connectionless class applies to point-to-point configurations over either dedicated or switched data transmission facilities, or to multipoint configurations over dedicated data transmission facilities. A characteristic of the unbalanced connectionless class is the existence of a single control station at one end of the data link plus one or more tributary stations at the other end(s) of the data link. The control station is responsible for determining when a tributary station is permitted to send. Neither the control station nor the tributary station(s) support any form of connection establishment/termination procedures, flow control procedures, data transfer acknowledgement procedures, or error recovery procedures, hence the designation "connectionless" class of procedures.

The balanced connectionless class applies to point-to-point configurations over either dedicated or switched data transmission facilities. A characteristic of the balanced connectionless class is the existence of two data stations, called peer stations, on a data link, that are each independently in control of when they can send. Neither peer station supports any form of connection establishment/termination procedures, flow control procedures, data transfer acknowledgement procedures, or error recovery procedures, hence the designation "connectionless" class of procedures.

For each class of procedures, a method of operation is specified in terms of the capabilities of the basic repertoire of commands and responses that are found in that class. A variety of optional functions are also listed. Procedural descriptions for the use of the optional functions are found in clause 6.

It is recognized that it is possible to construct symmetrical configurations for operation on a single data circuit from the unbalanced classes of procedures which are defined in this International Standard. For example, the combination of two unbalanced procedures (with I frame flow as commands only) in opposite directions would create a symmetrical point-to-point configuration (as illustrated in figure 3).

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

## 1 Scope

This International Standard describes the HDLC unbalanced classes of procedures, the HDLC balanced class of procedures, and the HDLC connectionless classes of procedures for synchronous or start/stop data transmission.

Balanced operation is intended for use in circumstances which require equal control at either end of the data link. Operational requirements are covered in accordance with the overall HDLC architecture. The procedures use the HDLC frame structure defined in ISO/IEC 3309 and the HDLC elements of procedures described in ISO/IEC 4335.

For the unbalanced classes, the data link consists of a primary station plus one or more secondary stations and operates in either the normal response mode or the asynchronous response mode in a point-to-point or multipoint configuration. For the balanced class, the data link consists of two combined stations and operates in the asynchronous balanced mode in a point-to-point configuration. For the unbalanced connectionless class, the data link consists of a control station plus one or more tributary stations and operates in the unbalanced connectionless-mode in a point-to-point or multipoint configuration. For the balanced connectionless class, the data link consists of two peer stations and operates in the balanced connectionless-mode in a point-to-point configuration. In each class, a basic repertoire of commands and responses is defined, but the capability of the data link may be modified by the use of optional functions.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provision of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO/IEC 646 : 1991, *Information technology — ISO 7-bit coded character set for information interchange.*

ISO 2382-9 : 1984, *Data processing — Vocabulary - Part 09: Data communication.*

ISO/IEC 3309 : 1993, *Information technology — Telecommunications and information exchange between systems — High-level data link control (HDLC) procedures — Frame structure.*

ISO/IEC 4335 : 1993, *Information technology — Telecommunications and information exchange between systems — High-level data link control (HDLC) procedures — Elements of procedures.*

ISO/IEC 8885 : 1993, *Information technology — Telecommunications and information exchange between systems — High-level data link control (HDLC) procedures — General purpose XID frame information field content and format.*

## 3 General description

### 3.1 Principles

#### 3.1.1 Types of data station

**3.1.1.1** Two types of data station are defined for the unbalanced classes of procedures (see figure 4):