

Data exchange for meter reading, tariff and load control —

Direct local data exchange

The European Standard EN 61107 : 1992 has the status of a
British Standard

Echange des données pour la lecture des
compteurs, contrôle des tarifs et de la
charge —
Echange des données directes en local

Zählerstandsübertragung, Tarif- und
Laststeuerung
Datenübertragung für festen und mobilen
Anschluß

UDC 621.398 : 654.94 : 681 : 327.8

Cooperating organizations

The European Committee for Electrotechnical Standardization (CENELEC), under whose supervision this European Standard was prepared, comprises the national committees of the following countries:

Austria	Italy
Belgium	Luxembourg
Denmark	Netherlands
Finland	Norway
France	Portugal
Germany	Spain
Greece	Sweden
Iceland	Switzerland
Ireland	United Kingdom

This British Standard, having been prepared under the direction of the Power Electrical Engineering Standards Policy Committee, was published under the authority of the Standards Board and comes into effect on 15 December 1992

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National foreword

This British Standard has been prepared under the direction of the Power Electrical Engineering Standards Policy Committee and is the English language version of EN 61107 : 1992, *Data exchange for meter reading tariff and load control — Direct local data exchange*, published by the European Committee for Electrotechnical Standardization (CENELEC). It is identical with IEC 1107 : 1992 published by the International Electrotechnical Commission (IEC).

IEC 1142, *Data exchange for meter reading tariff and load control — local bus* is in preparation. When this is published it is envisaged that it will be adopted as BS EN 61142.

Direct local data exchange is a means for reading a single meter whereas local bus has the ability to read multiple meters.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

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Descriptors: Electrical energy measurement, electrical energy meter reading, tariff control, load control, data exchange

English version

**Data exchange for meter reading, tariff and load
control —
Direct local data exchange**
(IEC 1107 : 1992)

Echange des données pour la lecture des
compteurs, contrôle des tarifs et de la
charge —
Echange des données directes en local
(CEI 1107 : 1992)

Zählerstandsübertragung, Tarif- und
Laststeuerung Datenübertragung für festen
und mobilen Anschluß
(IEC 1107 : 1992)

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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 **Documents**
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Foreword

The text of document 13(CO)1015, as prepared by IEC Technical Committee No. 13, Equipment for electrical energy measurement and load control, was submitted to the IEC-CENELEC parallel vote in May 1991.

The reference document was approved by CENELEC as EN 61107 on 24 March 1992.

The following dates were fixed:

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of an identical national
standard
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of conflicting national
standards

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INTRODUCTION

This International Standard has been established by Working Group No. 14: Data exchange for meter reading, tariff and load control of Technical Committee No. 13: Equipment for electrical energy measurement and load control.

The Working Group has the task of establishing standards, by reference to ISO Standards, necessary for data exchanges by different communication media, for automatic meter reading, tariff and load control, consumer information.

The media can be either distribution line carrier, telephone (including ISDN), radio or other electrical or optical systems and they may be used for local or remote data exchanges.

Meter reading and programming may be performed manually by a meter reader, or supported by means of a local communication system, or automatically by means of a remote communication system. Manual meter reading that means the reader has access the meter, and reads each register while "supported" meter reading implies the use of a communication system or a local bus system and a hand-held unit (HHU). Fully automatic meter reading implies a remote communication system such as those involving distribution line carrier or telephone systems.

This International Standard describes a method for direct local data exchange, where the tariff device is read and programmed using a hand-held unit directly connected to the meter.

DATA EXCHANGE FOR METER READING, TARIFF AND LOAD CONTROL – DIRECT LOCAL DATA EXCHANGE

1 General

1.1 Scope and object

This International Standard presents hardware and protocol specifications for local systems, while specifications for a remote system falls within the scope of another document.

This standard deals with direct local systems, in which the hand-held unit (HHU) is connected to one tariff device only at a time. Connection can be permanent or disconnectable through an electrical or optical coupling. The protocol took as its basis the basic reference model for communication between open systems (OSI).

Considering the fact that several systems are in practical use already, particular care was taken to maintain compatibility with existing systems and/or system components and their relevant protocols.

The protocol permits the reading and programming of tariff devices. It has been designed to be particularly suitable for the environment of electricity metering, especially as regards electrical isolation, and software security. While the protocol is well-defined, its use and application is left to the user.

This standard prescribes the hardware and software preconditions which permit an exchange of data between a tariff device and an HHU. The connection to the HHU may be either permanent or disconnectable. Electrical as well as optical couplers are possible. An electrical contact is recommended for use with a fixed connection. The optical coupler should be easily disconnectable to enable data collection via an HHU. This standard incorporates parts of ISO 7498, augmented by further conditions concerning, for example, an optical interface, protocol controlled baud rate switchover and data transmission without acknowledgment of receipt. The preparatory work took as its basis the reference model for communication in open systems ISO 7498.

1.2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All normative documents 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 normative documents listed below. Members of IEC and ISO maintain registers of currently valid International Standard.

ISO 646: 1983, *Information processing – ISO 7-bit coded character set for information interchange*.

ISO 1155: 1978, *Information processing – Use of longitudinal parity to detect errors in information messages*.

ISO 1177: 1985, *Information processing – Character structure for start/stop and synchronous character-oriented transmission.*

ISO 1745: 1975, *Information processing – Basic mode control procedures for data communication systems.*

ISO 7480: 1984, *Information processing – Start/stop transmission signal quality at DTE/DCE interfaces.*

ISO 7498: 1984, *Information processing systems – Open systems Interconnection – Basic reference model.*

2 Definitions

For the purposes of this International Standard, the following definitions apply:

hand-held unit (HHU): Portable equipment for transferring data to or from tariff devices, or electricity meters.

local data exchange: Data exchange between one or a group of tariff devices and a hand-held unit.

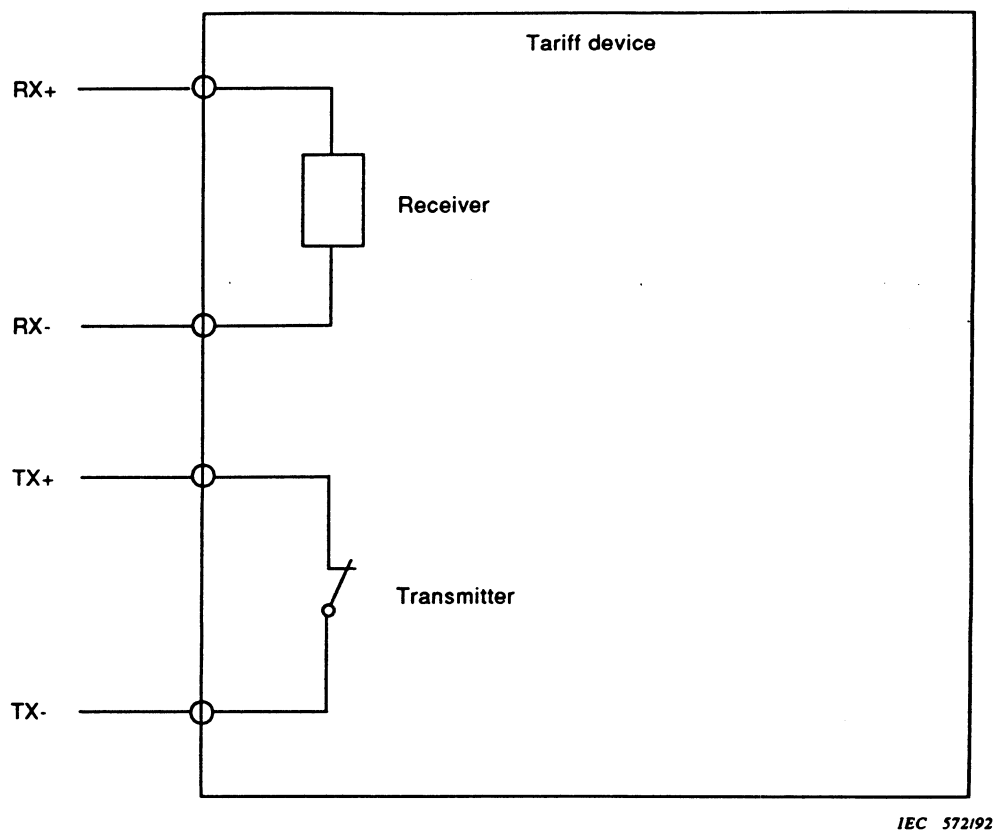
remote data exchange: Data exchange between a data collection centre and one or a group of tariff devices via a data network.

tariff device: Fixed data collection unit, normally linked or combined with an electricity meter.

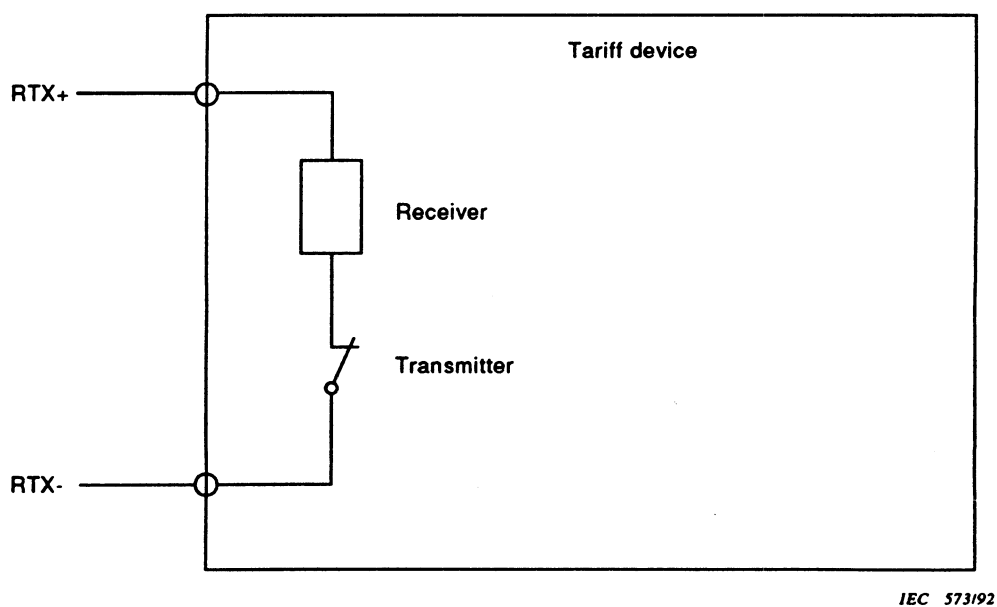
3 Physical properties

3.1 Electrical interface

- a) Type of signal:
20 mA current loop (ISO 7498 with potential separation).
- b) Power supply:
On the tariff device side the interface is passive (ISO 7498). The HHU supplies the necessary power.
- c) Connections:
Via terminals or suitable connectors.



a) Circuit arrangement in 4-wire configuration

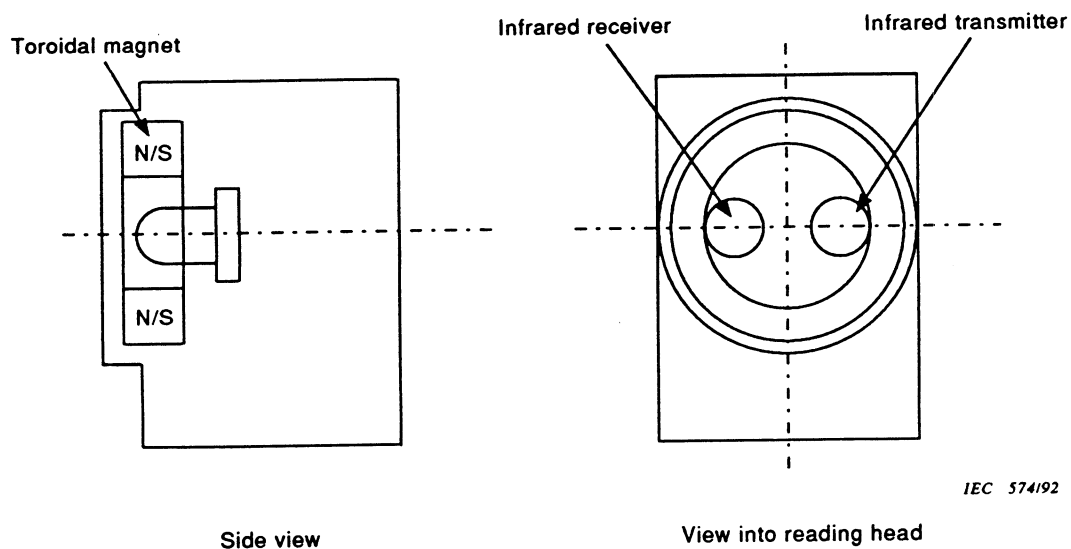


b) Circuit arrangement in 2-wire configuration

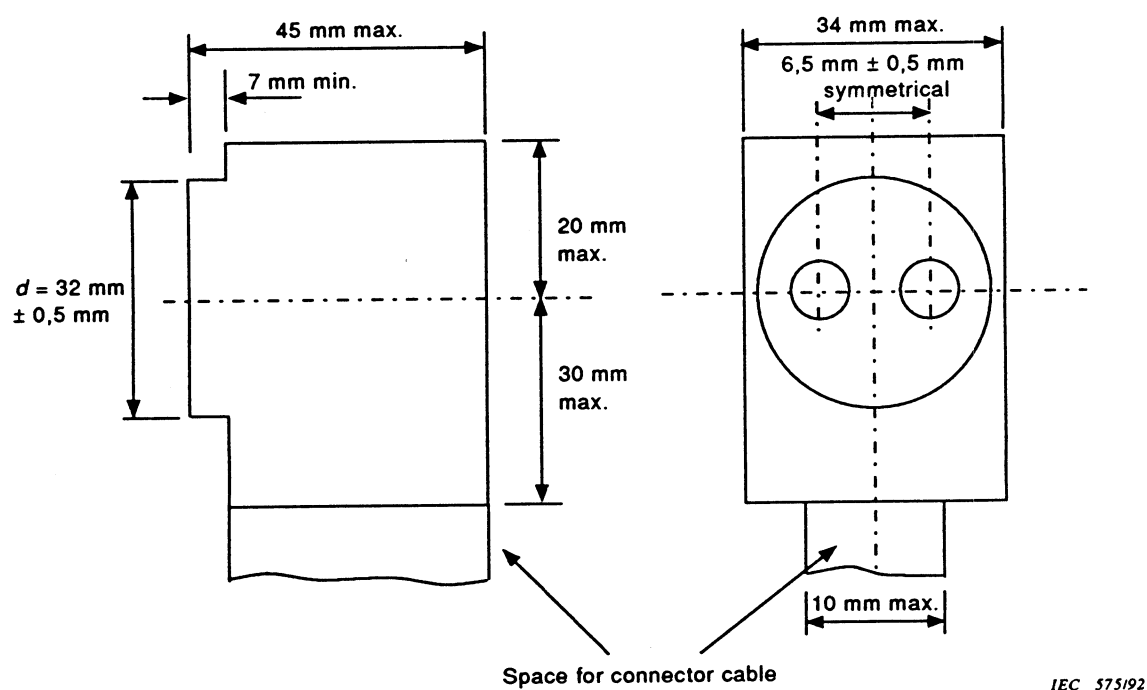
Figure 1 – Circuit diagram

3.2 Optical interface

3.2.1 Construction of the reading head



a) Arrangement of components



b) Dimensions

Figure 2 – Construction of the reading head