INTERNATIONAL STANDARD

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Information processing systems — Information exchange between systems — Synchronous transmission signal quality at DTE/DCE interfaces

Systèmes de traitement de l'information — Échange d'informations entre systèmes — Qualité des signaux en transmission synchrone à l'interface ETTD/ETCD

Reference number
ISO 9543 : 1989 (E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 9543 was prepared by Technical Committee ISO/TC 97, *Information processing systems.*

Annex A of this International Standard is for information only.

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Information processing systems — Information exchange between systems — Synchronous transmission signal quality at DTE/DCE interfaces

1 Scope

1.1 This International Standard specifies signal quality requirements for serial data transmission at the interface between synchronous transmission Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE). The interface referred to in this International Standard conforms to CCITT Recommendations V.24 (telephone networks), X.24 (data networks) as specified in DCEs of CCITT Recommendations:

V.22, V.22bis, V.23, V.26. V.26bis, V.26ter, V.27, V.27bis, V.27ter, V.29, V.32, V.33, or

X.21bis together with V.28, electrical characteristics; or

V.35 together with V.28/V.35 electrical characteristics; or

V.36, V.37 or X.21 together with V.10/V.11, electrical characteristics; or

X.22 together with V.11, electrical characteristics.

It is also recognized and considered that during the evolution of ISDN there will exist V.-series and X.-series type interfaces at ISDN Reference point R, as specified in CCITT Recommendations V.110, X.30 and X.31.

The speed limitation is determined by the referenced CCITT DCE Recommendations in the X. (e.g. X.10) and V. (e.g. V.5, V.6) series.

The signal quality requirement is limited to synchronous transmission at the interface with synchronous DCEs. Signal quality pertaining to asynchronous DTEs is not part of this International Standard.

1.2 This International Standard recognizes the need to have performance categories of signal quality depending on the type of interchange circuits used at the interface for signal element timing. Two classes of timing, codirectional timing and contradirectional timing, are considered.

The signal quality is categorized by measurements of timing displacement between data and timing signals, of jitter, duty cycle, and accuracy of the timing signals. Application to ISDN Reference point S/T is excluded.

1.3 This International Standard is of particular importance when the interconnected equipment is furnished by different organizations. It does not attempt to indicate what action, if any, is to be taken if the limits are not met, but it is intended to provide a basis for agreement between parties involved.

1.4 This International Standard does not describe the signal quality of the DCE or the line associated with it. Neither does it describe any requirement for an acceptable bit error rate.

1.5 This International Standard may also be used for DTE to DTE direct connections when the referenced CCITT Interfaces are applied.

2 Normative references

The following standards 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 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 1282-9 : 1984, *Data processing — Vocabulary — Part 09: Data communication.*

CCITT Recommendation V.5 : 1984, *Standardization of data signalling rates for synchronous data transmission in the general switched telephone network.*

CCITT Recommendation V.6 : 1984, *Standardization of data signalling rates for synchronous data transmission on leased telephone-type circuits.*

CCITT Recommendation V.10 (= X.26) : 1984, *Electrical characteristics for unbalanced double-current interchange circuits for general use with integrated circuit equipment in the field of data communications.*

CCITT Recommendation V.11 (= X.27) : 1984, *Electrical characteristics for balanced double-current interchange circuits for general use with integrated circuit equipment in the field of data communications.*

CCITT Recommendation V.22 : 1984, *1 200 bits per second duplex modem standardized for use on the general switched telephone network and on point-to-point 2-wire leased circuits.*

CCITT Recommendation V.22*bis* : 1984, *2 400 bits per second duplex modem using the frequency division technique standardized for use on the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits.*

CCITT Recommendation V.23 : 1984, *600/1 200 baud modem standardized for use in the general switched telephone network.*

CCITT Recommendation V.24 : 1984, *List of definitions for interchange circuits between data terminal equipment and data circuit-terminating equipment.*

CCITT Recommendation V.26 : 1984, *2 400 bits per second modem standardized for use on 4-wire leased telephone-type circuits.*

CCITT Recommendation V.26*bis* : 1984, *2 400/1 200 bits per second modem standardized for use in the general switched telephone network.*

CCITT Recommendation V.26*ter* : 1984, *2 400 bits per second duplex modem using the echo cancellation technique standardized for use on the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits.*

CCITT Recommendation V.27 : 1984, *4 800 bits per second modem with manual equalizer standardized for use on leased telephone-type circuits.*

CCITT Recommendation V.27*bis* : 1984, *4 800/2 400 bits per second modem with automatic equalizer standardized for use on leased telephone-type circuits.*

CCITT Recommendation V.27*ter* : 1984, *4 800/2 400 bits per second moderm standardized for use in the general switched telephone network.*

CCITT Recommendation V.28 : 1984, *Electrical characteristics for unbalanced double-current interchange circuits.*

CCITT Recommendation V.29 : 1984, *9 600 bits per second modem standardized for use on point-to-point 4-wire leased telephone-type circuits.*

CCITT Recommendation V.32 : 1984, *A family of 2-wire, duplex modems operating at data signalling rates of up to 9 600 bit/s for use on the general switched telephone network and on leased telephone-type circuits.*

CCITT Recommendation V.33 : 1984, *14 400 bits per second modem standardized for use on point-to-point 4-wire leased telephone-type circuits.*

CCITT Recommendation V.35 : 1984, *Data transmission at 48 kilobits per second using 60-108 kHz group band circuits.*

CCITT Recommendation V.36 : 1984, *Modems for synchronous data transmission using 60-108 kHz group band circuits.*

CCITT Recommendation V.37 : 1984, *Synchronous data transmission at a data signalling rate higher than 72 kbit/s using 60-108 kHz group band circuits.*

CCITT Recommendation V.110 : 1984, *Support of data terminal equipments (DTEs) with V-series type interfaces by an integrated services digital network (ISDN).*

CCITT Recommendation X.10 : 1984, *Categories of access for data terminal equipment (DTE) to public data transmission services provided by PDNs and/or ISDNs through terminal adaptors.*

CCITT Recommendation X.21 : 1984, *Interface between data terminal equipment (DTE) and data circuit-terminating equipment (DCE) for synchronous operation on public data networks.*

CCITT Recommendation X.21*bis* : 1984, *Use on public data networks of data terminal equipment (DTE) which is designed for interfacing to synchronous V-series modems.*

CCITT Recommendation X.22 : 1984, *Multiplex DTE/DCE interface for user clases 3-6.*

CCITT Recommendation X.24 : 1984, *List of definitions for interchange circuits between data terminal equipment (DTE) and data circuit-terminating equipment (DCE) on public data networks.*

CCITT Recommendation X.30 : 1984, *Support of X.21 and X.21bis based data terminal equipments (DTEs) by an integrated services digital network (ISDN).*

CCITT Recommendation X.31 : 1984, *Support of packet mode terminal equipment by an ISDN.*