



Data communication — Arrangements for DTE to DTE physical connection using V.24 and X.24 interchange circuits

Transmission des données — Arrangements pour la connexion physique ETTD à ETTD utilisant des circuits de jonction V.24 et X.24

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The reasons which led to the decision to publish this document in the form of a technical report type 2 are explained in the Introduction.

0 Introduction

Consideration has been given to the existing DTE/DCE interface specifications which provide the mechanical, electrical, functional and procedural characteristics for the physical interconnection of DTEs to modems in telephone networks (CCITT V-series Recommendations) or to termination units of data networks (CCITT X-series Recommendations); a unique ISO requirement exists to further define the direct interconnection of such DTEs without intervening telecommunication facilities.

Also, in the DTE to DTE physical connection, the distance of interconnection may be considerably greater when compared with the usual short telephone/data network interconnections; an additional option to permit the alternate use of balanced type electrical characteristics is therefore required.

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In the case of synchronous transmission, a variety of arrangements to provide signal element timing in lieu of the network clocks must also be supported.

In view of further developments of interfaces for future telecommunication facilities by the CCITT, an appropriate time for reconsidering the publication of an International Standard may be at the end of the CCITT 1985 to 1988 study period.

This Technical Report deals with the interconnection of Data Terminal Equipment (DTE) without any signal conversion, whereby a DTE is not attached to Data Circuit-terminating Equipment (DCE) which is part of a telecommunication facility.

The desired DTE to DTE direct connection may be totally located at the user's territory. The aim being to relate these interconnections to the elements of the CCITT recommended/ISO standardized DTE/DCE interfaces, in order to avoid equipment proliferation.

1 Scope and field of application

This Technical Report describes various arrangements for the interconnection of Data Terminal Equipment (DTE), without intermediate Data Circuit-terminating Equipment (DCE), in terms of electrical, mechanical, and functional characteristics.

This Technical Report applies to DTEs with interface circuits standardized in CCITT Recommendation V.24 for data transmission over telephone networks or with interface circuits standardized in CCITT Recommendation X.24 for transmission over public data networks.

The interconnections are restricted to point-to-point connections. Extension to multipoint configurations requires further study.

This Technical Report applies primarily to DTEs which employ the balanced electrical characteristics of CCITT Recommendation V.11 (X.27) for data signalling rates up to 10 Mbit/s. Additionally, it may be applied to DTEs employing the unbalanced electrical characteristics of CCITT Recommendation V.10 (X.26) for data signalling rates up to 100 kbit/s and of CCITT Recommendation V.28 for data rates below 20 kbit/s. Interworking between a DTE employing V.10 (X.26) and a DTE employing V.11 (X.27) or with a DTE employing V.28 is permitted.

The interconnection may be used for start-stop and synchronous transmission. For synchronous transmission, the signal element timing may be provided by either one DTE, both DTEs, or by an external signal element timing source which is inserted as intermediate equipment.

2 References

ISO 2110, *Data Communication — 25-pin DTE/DCE interface connector and pin assignments.*

ISO 4902, *Data communication — 37-pin and 9-pin DTE/DCE interface connectors and pin assignments.*

ISO 4903, *Data communication — 15-pin DTE/DCE interface connector and pin assignments.*

CCITT Recommendation V.10 (or X.26), *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 (or X.27), *Electrical characteristics for balanced double-current interchange circuits for general use with integrated circuit equipment in the field of data communications.*

CCITT Recommendation V.24, *List of definitions for interchange circuits between data terminal equipment (DTE) and data circuit-terminating equipment (DCE).*

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

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

3 Interconnection configurations

Three types of DTE to DTE interconnection configurations are considered for point-to-point connections with interfaces according to CCITT Recommendations V.24 and X.24. They are shown in figure 1.

There are two lines of demarcation between the two interconnecting DTEs, one located at each DTE connector. The adaptor and any cable linking these two DTE connectors are not part of either DTE.

Intermediate balanced pair cable may be provided with a length mainly dependent on the parameters of the electrical characteristics of the interchange circuits.

4 Interchange circuit requirements

The interchange circuit requirements are specified in terms of electrical, functional, mechanical, and interchange point cross-over characteristics.

4.1 Electrical characteristics

The electrical characteristics of CCITT Recommendation V.11 are preferred in all configurations.

Recommendation V.11 (X.27) gives guidance to operational constraints imposed by the length, balance, and terminating resistance of the interconnecting cable in relation to the data signalling rate. With additional considerations, longer distances may be possible.

DTEs employing the unbalanced electrical characteristics, with the category 1 receiver configuration of CCITT Recommendation V.10 (X.26), are also permitted for applications up to 100 kbit/s. Reduced performance in terms of cable length may be experienced, however. Reference should be made to CCITT Recommendation V.10 (X.26) for constraints imposed by length of interconnecting cable in relation to data signalling rate.

Interoperation between DTEs employing V.10 (X.26) generators on one side of the DTE/DTE interface and V.11 (X.27) generators on the other side of the DTE/DTE interface is permitted as described in CCITT Recommendation V.10 (X.26).

In addition, DTEs using the electrical characteristics for unbalanced double-current interchange circuits of CCITT Recommendation V.28 are permitted for applications below 20 kbit/s. The distance capability however is limited.

Interoperation between a DTE employing V.10 (X.26) electrical characteristics and a DTE employing V.28 characteristics is also permitted, provided the precautions outlined in annex D of ISO 4903 are observed.

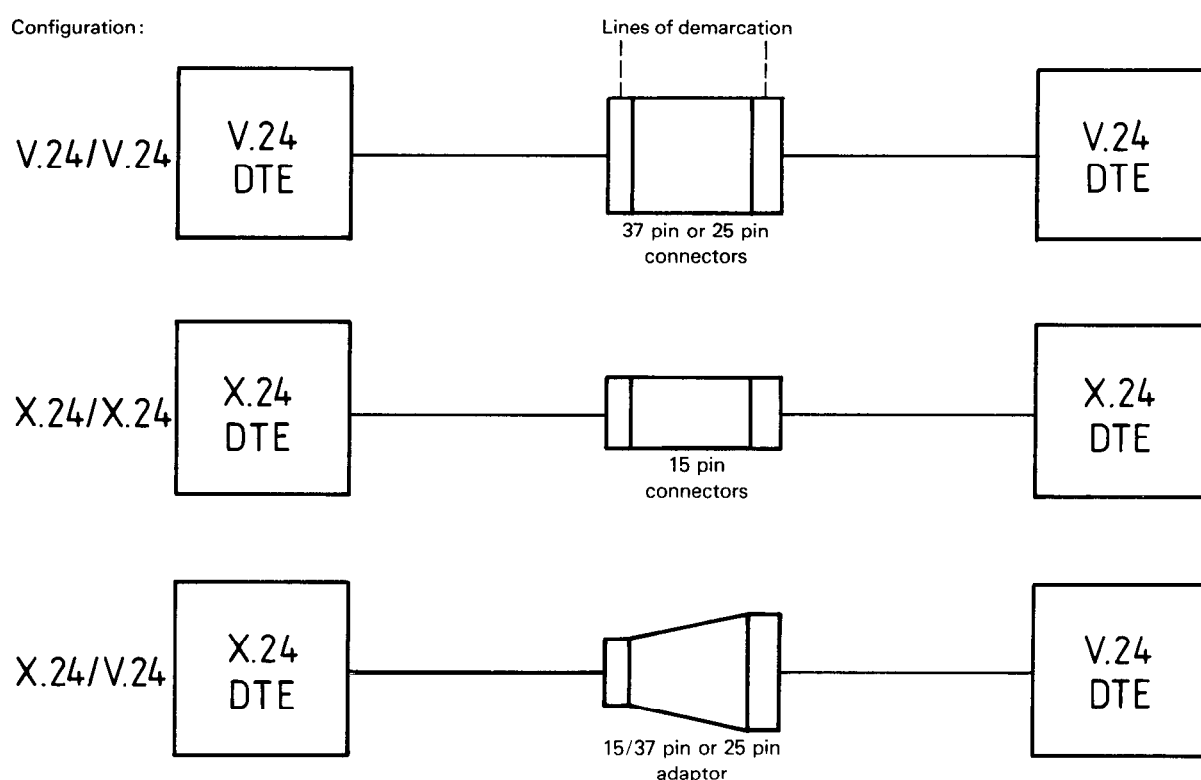


Figure 1 — DTE interconnection configurations