



Customer Interface Publication: KCOM (Hull) CIP010

Technical Characteristics of the 2048 kbit/s (2Mbit/s) digital leased line (Frame Relay)

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Note: this publication replaces Torch Communications Ltd CIP006 on the same subject – see document history.

1. Scope

This document specifies the technical characteristics of a 2048kbit/s (2Mbit/s) digital leased line interface operated by KCOM Group PLC delivered to a customer at the Network Terminating Point (NTP). This interface is part of the KCOM Group PLC Frame Relay service offering.

Much of the information contained in this document has been published previously in various documents such as ITU-T, ETSI and BSI standards.

Changes to the network that affect the correct working of approved terminal equipment will be published by KCOM Group PLC in various documents made available from the address below. If the changes impact on this document then it will be updated.

Enquiries relating to the technical content of this document and the availability of other publications should be directed to:

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Regulatory Affairs and Technology Development
37 Carr Lane,
Kingston Upon Hull.
HU1 3RE

Telephone: 01482 602100
E-mail: regulatory@kcom.com

2. General

The KCOM Group PLC 2048 kbit/s (2Mbit/s) frame relay digital leased line service is presented to the customer via both the ITU-T recommendation G.703 (75ohm) interface and ITU-T recommendation X.21 interface.

The interface enables transport of Frame Relay frames on a point to point basis.

3. The Network Termination Point

3.1 ITU-T recommendation G.703

The network termination point shall be two unbalanced 75ohm BNC sockets labelled TFC IN and TFC OUT.

3.2 ITU-T recommendation X.21

The network termination point shall be a 15-way 'd' connector (as defined in ISO 4903) mounted on the Network Terminating and Test Apparatus (NTTA)/Network Terminating

Equipment (NTE) based on the customer premises.

4. Electrical Characteristics of the Interface

4.1 ITU-T recommendation G.703

The 2048kbit/s (2Mbit/s) Frame Relay digital leased line interface service is delivered using a digital bearer in accordance with clause 9 of ITU-T recommendation G.703 ^[2] and can be supplied as either structured or un-structured.

When structured, the frame structure is in accordance ^[4] with ITU-T recommendation G.704 ^[4].

4.2 ITU-T recommendation X.21

The interchange circuits used are as follows :

ITU-T Circuit designation	Direction of signalling	Circuit Description	Pin A	Pin B
G	To DCE	Ground / Common Return	8	-
T	To DCE	Transmitted data	2	9
R	From DCE	Received data	4	11
C	To DCE	Control	3	10
I	From DCE	Indication	5	12
S	From DCE	Signal element timing	6	13
B	From DCE	Byte timing	7	14

A full description of the circuits can be found in ITU-T recommendation X.24^[6].

The electrical characteristics of the interface are compatible with ITU-T recommendation X.27 (V.11)^[7] with cable termination in the load. This condition also applies to the DTE.

5. Frame Relay Characteristics

The Frame Relay service offers Permanent Virtual Circuit (PVC) between two Virtual Circuit (VC) terminations.

Data transfer is in accordance with ITU-T Q.922 Annex A ^[11] (See Frame Relay Forum PVC User to Network Interface Specification FRF 1.2 ^[12] clause 2.2).

Control signalling is in accordance with ITU-T Q.933 Annex A ^[13] (See Frame Relay Forum PVC User to Network Interface Specification FRF 1.2 ^[12] clause 2.3).

6. Safety & EMC Information

6.1 Safety

The normal working voltages of the ITU-T recommendation G.703 ^[2] 2048 kbit/s (2Mbit/s)

digital leased line interface are defined in clause 9 of ITU-T recommendation G.703 ^[2].

The normal working voltages of the ITU-T recommendation X.21 ^[5] 2048 kbit/s digital leased line interface are defined in ITU-T recommendation X.27 (V.11)^[7].

The interfaces presented to the customer is classified as unexposed as defined in the CENELEC Report/ETSI Guide ROBT-002/EG 201 212 ^[3].

6.2 EMC

The network equipment and network terminating equipment related to the provision of the interface comply with the current EMC regulations.

Whilst predominantly installed in commercial and light industrial environments, this does not preclude the interface being installed in other environments e.g. residential, industrial. This should be taken into account by the terminal equipment manufacturer when determining the limits of compliance relevant to their equipment in relation to the protection requirements of the EMC directive.

7. Terminal Equipment Specifications

The minimum recommended terminal equipment performance specifications are:

- ITU-T G.703 service: BS PD 7024^[1] (unstructured 75 ohm)
- ITU-T X.21 service: TBR 1 ^[9]

In addition, the following Frame Relay Forum documents are recommended:

- FRF 1.2 ^[12] - User to Network Implementation Agreement
- FRF 14 ^[14] - Physical Layer Interface Implementation Agreement

The minimum recommended terminal equipment EMC specifications are listed in the Official Journal of the European Communities for use under the Electromagnetic Compatibility Directive (89/336). The lists are updated regularly and the terminal manufacturer is recommended to comply with the listed standards applicable to their equipment and the target electromagnetic environment.

The minimum recommended terminal equipment electrical safety specifications are listed in the Official Journal of the European Communities for use under the Low Voltage Directive (73/23/EEC). The lists are updated regularly and the terminal manufacturer is recommended to comply with the listed standards applicable to their equipment.

8. Glossary

BS	British Standard
BSI	British Standards Institute
DCE	Data Circuit-terminating Equipment
DTE	Data Terminal Equipment
EC	European Community
EMC	Electromagnetic Compatibility
ETSI	European Telecommunications Standards Institute
ITU-T	International Telecommunications Union - Telecommunications Sector
NTE	Network Termination Equipment
NTP	Network Terminating Point
NTTA	Network Terminating and Test Apparatus
PD	Published Document
PVC	Permanent Virtual Circuit
TE	Terminal equipment
TFC IN	Traffic In
TFC OUT	Traffic Out

9. References

Ref	Standard	Title	Date
[1]	PD 7024: 1995	Essential requirements for Terminal Equipment intended for connection to digital leased lines with 75 ohm G.703 interfaces and rates of 2Mbit/s unstructured	1995
[2]	ITU-T Recommendation G.703	Physical/Electrical Characteristics of hierarchical digital interfaces	2001
[3]	R0BT-002/EG 201, 212, V.1.2.1 (1998-11)	Electrical Safety ; Classification of interfaces for equipment to be connected to telecommunications networks	1998
[4]	ITU-T Recommendation G.704	Synchronous Frame Structures Used at Primary and Secondary Hierarchical Levels	1998
[5]	ITU-T Recommendation X.21	Interface Between Data Terminal Equipment (DTE) and Data Circuit Terminating Equipment (DCE) for Synchronous Operation on Public Data Networks	1992
[6]	ITU-T Recommendation X.24	List of definitions for interchange circuits between data terminal equipment and data circuit-terminating equipment on public data networks	1993
[7]	ITU-T Recommendation X.27	Electrical Characteristics for Balanced Double Current Interchange Circuits for general use with Integrated Circuit Equipment in the field of Data Communication	1988
[8]	ISO 4903 Assignments	15 pole DTE/DCE Interface Connector and Contact Number	
[9]	ETSI TBR 1	Attachment Requirements for terminal equipment to be connected to circuit switched data networks and leased circuits using a CCITT X.21 interface	1995
[10]	ETSI TBR 12 inc. amendment 1	Open Network Provision Technical Requirements : 2048kbit/s digital unstructured leased line (D2048U). Attachment requirements for terminal equipment	1996
[11]	ITU-T Recommendation Q.922	ITU-T Digital Subscriber Signalling System No. 1 (DSS 1) Data Link Layer	1992
[12]	FRF 1.2	Frame Relay Forum User-to-Network (UNI) Implementation Agreement	2000
[13]	ITU-T Recommendation Q.933	ITU-T Digital Subscriber Signalling System No. 1 (DSS 1) Data Link Layer – Signalling Specifications For Frame Mode Switched And Permanent Virtual Connection Control and Status Monitoring	1995
[14]	FRF 14	Frame Relay Forum Physical Layer Interface Implementation Agreement	1998

The above documents (with the exception of the Frame Relay Forum documents) may be obtained from:

British Standards Institution
Customer Services, Sales Department
389 Chiswick High Road,
London
W4 4AL
Telephone: 0208 996 9001
Facsimile: 0208 996 7001

The Frame Relay Forum documents can be obtained from the following URL:

<http://www.frforum.com/>

10. History

Date	Issue	Comments	Author
			M. Budd
		Precursor document	
		Technical Characteristics of the 2Mbit/s digital leased line interface (Frame Relay) [Issue 1.0 May 2000] TCH CIP006	
December 2003	Issue 1.0	KCOM Group PLC publication to M. D. Crowther replace the above	
August 2007	Issue 1.1	KCOM Group PLC publication to M. D. Crowther replace the above and change to contact information	
April 2016	Issue 1.2	KCOM name change and formatting changes	