



BS 6532 : Part 1 : 1984

UDC 681.324.02

© British Standards Institution. No part of this publication may be photocopied or otherwise reproduced without the prior permission in writing of BSI

British Standard

Data terminal equipment for attachment to 10 Mbps slotted ring local area network

**Part 1. Specification for media access control
procedures for data terminal equipment**

Équipement terminal de données pour raccordement à un réseau local en anneau
de 10 Mbps à cadre (temporel)

Partie 1. Procédures de contrôle d'accès au réseau de l'équipement terminal de données —
Spécifications

Datenendeinrichtungen zum Anschluß an 10 Mbps-lokale Schlitzringnetzwerke
Teil 1. Verfahren bei Datenzugriffskontrolle in Datenendeinrichtungen

British Standards Institution

AVA Documents
Document Sharing Hub

Foreword

This Part of BS 6532 was prepared under the direction of the Office and Information Standards Committee at the request of the Department of Trade and Industry.

BS 6532 comprises two Parts, the other Part being as follows:

Part 2 Specification for implementation requirements for media access control in general purpose data terminal equipment

BS 6531 specifies requirements for specific aspects of the ring as follows:

BS 6531 10 Mbps slotted ring local area network

Part 1 Specification for the coding of bits and structure of slots and mini-packets

Part 2 Specification for configuration

Part 3 Specification for free-standing repeaters

Part 4 Specification for Basic and Enhanced Class nodes with Type 1 node/DTE interface

Part 5 Specification for monitor

Part 6 Specification for logging station

Part 7 Specification for slave power supplies

For additional information refer to the foreword of BS 6531 : Part 1.

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

Contents

	Page
Foreword	Inside front cover
Committees responsible	Back cover
Specification	
Section one. General	
1 Scope	2
2 Field of application	2
3 Reference	2
4 Definitions and notation	2
Section two. Media access control service	
5 Media access control service access points (MAC-SAPs)	7
6 Media access control service data units (MA-SDUs)	7
Section three. Transmission	
7 Frame format	9
8 Procedure for transmission of frames	10
9 Method of transmitting logical mini-packets	12
10 Determination of transmission result	13
Section four. Reception	
11 Reception of logical mini-packets	14
12 Mapping of logical mini-packets on to frames	15
13 Processing	16
14 Issue of MA-DATA indication	17
Section five. Functions at node interface	
15 General	19
16 Node interface lines	19
17 Read registers	22
18 Write registers	24
Tables	
1 Notation for node interface lines	3
2 Notation for read and write registers	4
3 Notation for register data fields	5
4 Notation for times	6
5 Notation for lengths	6
6 Read registers	20
7 Write registers	21
8 Representation of mini-packet data octet count	23

Section one. General

1 Scope

1.1 This Part of BS 6532 specifies the procedures to be used by data terminal equipment (DTE) at the time of communication:

(a) when transmitting:

- (1) in the construction of a frame in response to a request from the user of the media access control service;
- (2) in the transfer of the frame to the local area network node for transmission as a series of mini-packets;
- (3) in determining whether the mini-packets have been successfully transmitted to the destination node;
- (4) in notifying the user of the media access control service whether the frame has been successfully transmitted.

NOTE. This event does not necessarily imply receipt by the remote media access control service user.

(b) when receiving:

- (1) in collecting from the node the contents of received mini-packets;
- (2) in assembling the contents into frames;
- (3) in transferring the contents of the frames to the user of the media access control service.

1.2 The standard specifies requirements to be met in each instance of the communication of a frame to and from a single media access control service access point (MAC-SAP), with conditions applying when multiplexing frames to and from one or more MAC-SAPs.

1.3 The standard also specifies a range of additional functions for communication with the local node that are not required for the communication of frames, but which may be used for management purposes and to improve efficiency and error detection.

1.4 Requirements relating to the implementation of these procedures are excluded.

NOTE. Implementation requirements for general purpose DTE are specified separately in Part 2 of this standard.

2 Field of application

2.1 This Part of BS 6532 is primarily for use for reference by Part 2 of this standard, which specifies implementation requirements for media access control in DTEs.

2.2 It may also be used to determine the procedural correctness or otherwise of the behaviour of a DTE when communicating, regardless of whether or not the DTE satisfies the implementation requirements of Part 2 of this standard.

3 Reference

BS 6532 Data terminal equipment for attachment to 10 Mbps slotted ring local area network

Part 2 Specification for implementation requirements for media access control in general purpose data terminal equipment

4 Definitions and notation

4.1 Definitions

For the purposes of this Part of BS 6532 the following definitions apply.

4.1.1 data terminal equipment (DTE). The equipment, attached to a network, that is the source and sink of data communicated over the network; except where otherwise specified, the DTE is always the local DTE (see 4.1.2).

4.1.2 local DTE. The DTE performing the procedures specified in this Part.

4.1.3 remote DTE. A DTE with which the local DTE communicates.

NOTE. When a DTE is sending frames to itself, the local and remote DTEs, and the local and remote nodes, are the same.

4.1.4 node. The data circuit-terminating equipment forming part of the local area network, through which the DTE has access to the local area network.

4.1.5 local node. The node to which the local DTE is attached.

4.1.6 remote node. A node through which a remote DTE is accessed (see note to 4.1.3).

4.1.7 Basic Class node. A node implementing the minimum permitted node functions.

4.1.8 Enhanced Class node. A node with extra functions designed to simplify frame processing by the DTE.

NOTE. These functions include filtering of incoming mini-packets and calculation of frame checksums.

4.1.9 media access control service (MAC service). An abstraction of the functions provided by the DTE for the transmission and reception of frames, as seen at a MAC service access point.

4.1.10 MAC service access point (MAC-SAP). A logical interface between the MAC service provider and a MAC service user in a single DTE.

4.1.10 MAC address. An address identifying a single MAC-SAP.

4.1.11 Frame. The protocol data unit used by the DTE to convey the data presented at the media access service interface.

Table 1. Notation for node interface lines

Notation	Type	Name
A0:P to A3:P	register address lines	ADDRESS LINE 0 to 3
ACK:N	control line	READ OR WRITE ACKNOWLEDGE
BPR:N	control line	BROADCAST MINI-PACKET RECEIVED
D0:P to D7:P	register data lines	DATA LINE 0 to 7
RD:N	control line	READ STROBE
RDN:N	control line	RECEIVE DONE
RINT:N	control line	BROADCAST OR ERROR MINI-PACKET RECEIVED
RTPA:N	control line	RECEIVED TYPE BIT A
RTPB:N	control line	RECEIVED TYPE BIT B
TCLK:N	control line	TRANSMISSION CLOCK
TDN:N	control line	TRANSMISSION DONE
TER:N	control line	TRANSMISSION ERROR
TEST:N	control line	ENABLE OVERRIDE
WT:N	control line	WRITE STROBE

4.1.12 mini-packet. The data unit used to convey fragments of frames between nodes, under the control of the DTE.

4.1.13 logical mini-packet. A mini-packet as visible to the DTE.

4.1.14 register address. The address of a logical (and possibly real) register in the local node, to and from which the DTE transfers data and control information.

4.1.15 read register. A logical (and possibly real) register in the local node, from which the DTE reads data.

4.1.16 write register. A logical (and possibly real) register in the local node, to which the DTE writes data.

4.1.17 register address line. A node interface line used in transferring a register address from the DTE to the node.

4.1.18 register data field. A part of the data written to or read from a register.

4.1.19 data line. A bi-directional node interface line used in transferring the data to or from a register.

4.1.20 local node address. The SR-LAN address assigned to the local node.

4.1.21 destination node address. An SR-LAN address identifying the node that is the destination of a mini-packet.

4.1.22 source node address. An SR-LAN address identifying the node that is the source of a mini-packet.

4.2 Notation

Tables 1 to 5 specify the notation used for node interface lines, registers, register data fields, times and lengths respectively.

BS 6532 : Part 1 : 1984
Specification. Section one

Table 2. Notation for read and write registers

Notation	Type	Name
NODE	read register	LOCAL NODE ADDRESS
RSUMCLR	write register	RECEIVER CHECKSUM CLEAR
Rx.B	read register	READ OCTET
Rx.BG	read register	READ OCTET AND CLEAR BUSY
Rx.CR	write register	RECEIVER AND NODE CONTROL
Rx.G	read register	CLEAR BUSY
Rx.SR	read register	RECEIVE STATUS REGISTER
Rx.SRC	read register	SOURCE NODE
Rx.SUM	read register	RECEIVER CHECKSUM
SSR	read/write register	SOURCE SELECTOR
TSUMCLR	write register	TRANSMITTER CHECKSUM CLEAR
Tx.B	write register	TRANSMIT DATA OCTET
Tx.BG	write register	TRANSMIT DATA OCTET AND GO
Tx.DST	write register	DESTINATION NODE
Tx.G	write register	TRANSMIT GO
Tx.SR	read register	TRANSMISSION STATUS REGISTER
Tx.SUM	read register	TRANSMITTER CHECKSUM
XCR	write register	EXTENDED CONTROL REGISTER
XSR	read register	EXTENDED STATUS REGISTER

Table 3. Notation for register data fields

Notation	Name	Used in
AOK	ALL SET UP	XSR
BCE	BROADCAST RECEPTION ENABLE	Rx.SR/CR
BPR	BROADCAST MINI-PACKET RECEIVED	Rx.SR
CTP	CONTROL TYPE RECEPTION	XCR
L0 to L3	MINI-PACKET LENGTH	XSR
LGE	LOG RECEPTION CONTROL	Rx.CR
LOG	ERROR MESSAGE MINI-PACKET RECEIVED	Rx.SR
MTPA	TYPE BIT A MASK	XCR
MTPB	TYPE BIT B MASK	XCR
NEN	NODE ENABLE	Rx.SR/CR
RDN	RECEIVE DONE	Rx.SR
RON	RING ON	XSR
ROT	REJECT ON TYPE	XCR
RRJ	RECEIVE REJECT	Rx.SR
RRST	RECEIVER RESET	Rx.CR
RSS	REJECT SELECTED SOURCE	Rx.SR/CR
RTPA	RECEIVED TYPE BIT A	XSR
RTPB	RECEIVED TYPE BIT B	XSR
RTRY	AUTO-RETRY ENABLE	Rx.SR/CR
TAC	TRANSMISSION RESPONSE – ACCEPTED	Tx.SR
TBY	TRANSMISSION RESPONSE – BUSY	Tx.SR
TCE	TRANSMISSION COMPARISON ERROR	Tx.SR
TDN	TRANSMISSION DONE	Tx.SR
TER	TRANSMISSION ERROR	Tx.SR
TIG	TRANSMISSION RESPONSE – IGNORED	Tx.SR
TRST	TRANSMITTER RESET	Rx.CR
TTPA	TRANSMIT TYPE BIT A	XCR
TTPB	TRANSMIT TYPE BIT B	XCR
TUS	TRANSMISSION RESPONSE – NOT SELECTED	Tx.SR

BS 6532 : Part 1 : 1984
Section one

Table 4. Notation for times

Notation	Name
$T(1)$	Transmit next mini-packet maximum delay
$T(2)$	Retry first mini-packet time
$T(3)$	Retry control and first data mini-packets on busy
$T(4)$	Retry subsequent data mini-packets on busy
$T(5)$	Whole frame transmit time
$T(6)$	Clear busy maximum delay on 2nd and 3rd mini-packets
$T(7)$	Minimum mini-packet waiting time
$T(8)$	Whole frame minimum waiting time
$T(9)$	Clear busy maximum delay on data mini-packets

Table 5. Notation for lengths

Notation	Name
S	Data field length indicator
M	Number of data octets in mini-packet

Section two. Media access control service

5 Media access control service access points (MAC-SAPs)

5.1 Function

The media access control service access points shall be the one or more abstract access points through which the MAC service is provided to the MAC service user or users.

5.2 MAC addresses

5.2.1 Just one MAC address shall be associated with each MAC-SAP.

5.2.2 Each MAC address shall be either 16 or 48 bits long.
NOTE. Where there is more than one MAC-SAP in the same DTE, it is not necessary that the same length MAC address is associated with each, though this will normally be the case and may be enforced by the DTE or required by the higher level protocols.

6 Media access control service data units (MA-SDUs)

6.1 Primitives

6.1.1 MA-DATA request

6.1.1.1 An MA-DATA request shall be the primitive, generated by the MAC service user at a MAC-SAP, that:

- (a) if the destination MAC-SAP is in a remote DTE, requests the transmission of a single frame;
- (b) if the destination MAC-SAP is in the local DTE, requests either the transmission of a frame via the SR-LAN back to the local DTE or the direct production of an MA-DATA indication without frame transmission.

6.1.1.2 The parameters of the MA-DATA request shall be:

- (a) the destination MAC address;
- (b) data field comprising 1 to 65 536 octets of transparently conveyed data;
- (c) requested service class (see 6.2.7).

6.1.2 MA-DATA confirm

6.1.2.1 An MA-DATA confirm shall be the primitive that:

- (a) if the destination MAC-SAP is in a remote DTE, notifies the MAC service user issuing the MA-DATA request the result of frame transmission as seen by the local node;
- (b) if the destination MAC-SAP is in the local DTE and the means of actioning the MA-DATA request is transmission of a frame via the SR-LAN, the result of frame transmission as seen by the local node acting as transmitter;
- (c) if the destination MAC-SAP is in the local DTE and the means of actioning the MA-DATA request is direct issue of an MA-DATA indication, whether or not the MA-DATA indication could be produced.

6.1.2.2 The parameters of MA-DATA confirm shall be:

- (a) transmission status (see 6.2.4);
- (b) provided service class (see 6.2.8).

6.1.2.3 There shall be a means of associating an MA-DATA confirm with the MA-DATA request to which it applies.

NOTE. Where only one MA-DATA request can be awaiting confirmation at one time, the association may be adequately provided by sequence; otherwise, some form of identification will be required.

6.1.3 MA-DATA indication

6.1.3.1 An MA-DATA indication shall be the primitive that notifies the MAC service user at the destination MAC-SAP of the reception of a frame or an MA-DATA request from another MAC-SAP in the local DTE.

6.1.3.2 The parameters of the MA-DATA indication shall be:

- (a) source MAC address;
- (b) destination MAC address;
- (c) data field comprising 1 to 65 536 octets of transparently conveyed data;
- (d) requested service class (see 6.2.7).

6.2 Parameters

6.2.1 Destination MAC address parameter. The destination MAC address shall be the MAC address that identifies the MAC-SAP to which delivery of the data in the data field is requested by the MAC service user.

NOTE. This MAC protocol requires that the length of the destination MAC address (16 or 48 bits) is the same as the MAC address assigned to the MAC-SAP that is the source of the MA-DATA request (see 6.2.6.1(g)), unless both source and destination MAC-SAPs are in the local DTE, in which case it is possible that the lengths differ.

6.2.2 Source MAC address parameter. The source MAC address shall be the source MAC address contained in the same frame as that in which the data in the data field was received.

NOTE. Since this protocol requires that the destination and source MAC addresses in a frame have the same length, and that the data in a frame be delivered to the local MAC-SAP which has an address equal to the destination MAC address in the frame, the source MAC address will have the same length as the local MAC-SAP, unless both source and destination MAC-SAPs are in the local DTE, in which case it is possible that the lengths differ.

6.2.3 Data field parameter. The data field shall be the string of octets, of length 1 to 65 536 octets, that represents the higher level protocol data unit (or multiples or fragments thereof) sent in a frame, unless both source and destination MAC-SAPs are in the local DTE, in which case the data field parameter in an MA-DATA indication may be derived directly from that in the MA-DATA request without frame transmission.

6.2.4 Transmission status parameter. In the case of a slotted ring local area network, the transmission status