

Quad Contra-directional Data Card Reference Manual

© Case Technology Ltd. 1997

STATUTORY NOTICES

APPROVALS

The Quad Contra-directional data card DT521, is approved for indirect connection to Telecommunication Systems under the General Approval Number NS/G/1234/J/100003.

This card does not contain safety isolation barriers, and any apparatus connected to it must conform with the safety requirements of the General Approval.

The safety status of the interface is SELV.

All PCB assemblies contain Electrostatic Sensitive Devices (ESDs) which may be permanently damaged if incorrectly handled. This equipment must be handled in accordance with BS5783 code of practice for the handling of electrostatic sensitive devices.

Case Technology Limited has made all reasonable efforts to ensure the accuracy of the content of this document but the information contained herein does not constitute a warranty of performance of the equipment and/or software described and no specifications given form part of any contract. This document does not constitute a licence to use or copy any software described herein and any such software must only be used in accordance with the terms of the licence supplied herewith.

Case Technology Limited reserves the right to make alterations to the equipment and software described without notice and assumes no liability for any loss or damage caused as a result of use of this document whether because of out of date or inaccurate information or otherwise.

Product and manufacturers' names referred to in this document are used for identification purposes only and Case Technology Limited acknowledges the intellectual property rights of their respective owners in the same.

This document is the copyright of Case Technology Limited and may not be reproduced, copied or stored in any computerised retrieval system by any means without the express written permission of Case Technology Limited.

Published by Case Technology Technical Publications Department

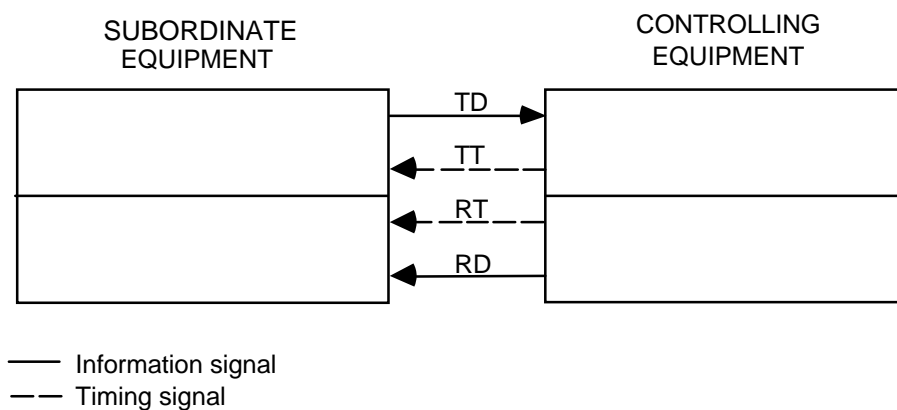
Contents

1	Description	1-1
2	Operation	1-2
3	Specifications	1-2
4	Fault Detection	1-3
5	Loopback	1-3
6	System Synchronisation	1-3
7	Switch and Link Settings	1-4
8	Control Ports	1-5
9	Status Ports	1-5
10	Indicators	1-5
11	I/O Connections	1-6

Quad Contra-directional Data Card

1. Description

The Quad G.703 Contra-directional data card DT521, provides 4 independent 64kbit/s interfaces to CCITT recommendation G.703. Each circuit may be configured as either controlling equipment, 'office terminal line side', or as a subordinate equipment, 'office terminal service side'.



TD = Transmit Data TT = Transmit Timing
RD = Receive Data RT = Receive Timing

When configured as subordinate equipment, it is possible to synchronise the multiplexer to the incoming timing.

2. Operation

The card generates 64kHz clock and byte alignment signals from the system timing. In controlling mode, these signals produce the TT and RT contra- directional timing output signals. Data is then transferred to and from the system using these signals.

In subordinate mode, the TT and RT signals are configured as inputs to the card. On board buffers are used to provide tolerance to jitter and wander on the incoming timing signals relative to the system timing.

If an over or under-flow of these buffers occurs, a controlled slip is carried out, i.e. 8 bits of data will be inserted or deleted.

In both modes, the clock violations are used to maintain the byte alignment of the data.

Controlling and Subordinate modes are selected by switches.

3. Specifications

CCITT G.703 Blue Book - Contra-directional interface, controlling and subordinate operation

CCITT G.823 Blue Book - Jitter Tolerance

CCITT G.736 Blue Book - Jitter Transfer

CCITT X.150 Blue Book - Test loops 3c and 2b.

DELAY: The card contributes less than 250 μ s in each direction

Typical power requirements: 4 Watts per card.

4. Fault Detection

The card can detect the presence of data loss (continuous state '0') and AIS (continuous state '1') on the contra-directional inputs. A time-out of 16, 33, 66, or 260 seconds can be selected for the fault detection time.

The above fault reports can be disabled by using an Alarm Inhibit facility. All these selections are made on Control Port 1.

In subordinate mode the card detects incoming clock loss.

All the above faults will raise 'Alarm 2' on Status Port 1 for each circuit, and illuminates the relevant circuit LED on the card. The bottom LED is for circuit 1, and the top LED is for circuit 4.

5. Loopback

All circuits support simultaneous local and remote loopback of data.

Note in subordinate mode, the incoming timing signals are not used during loop to allow the card to operate without requiring external connections.

6. System Synchronisation

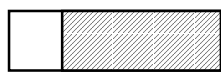
In subordinate mode, circuits 1 and 2 of the card may be used to provide reference 8kHz timing signals for system synchronisation. Circuit 1 may be used to drive the multiplexer 8k1 sync source line, and circuit 2 may be used to drive the 8k2 sync source line. This selection is carried out by links LK1 and LK2.

The reference 8kHz signals are maintained when circuits 1 and 2 are looped.

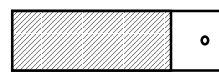
7. Switch and Link Settings

Switches are used to select controlling or subordinate equipment modes for each circuit as follows:-

CCT 1	CCT 2	CCT 3	CCT 4
S4	S3	S2	S1
S30	S22	S14	S6
S31	S23	S15	S7
S32	S24	S16	S8
S34	S26	S18	S10
S35	S27	S19	S11
S36	S28	S21	S12



Controlling



Sub-ordinate

The drop data and the insert data may be inverted by means of switches, for each circuit as shown below:-

	CCT 1	CCT 2	CCT 3	CCT 4
Drop	S40	S42	S44	S46
Insert	S41	S43	S45	S47



Invert



Normal

Links are used to select the 8kHz timing signals when in subordinate mode. The system 8k1 signal may be selected from CCT 1 by fitting LK1 in position 2-3, and the system 8k2 signal may be selected from CCT 2 by fitting LK2 in position 2-3. The links should be in position 1-2 if the timing signals are not required.

8. Control Ports

Each Circuit supports Control Port 1 which is allocated as follows:-

D0	-	LED*
D1	-	LOOP*
D2	-	ALARM INHIBIT*
D4 D3	-	TIME-OUT SELECTION FOR DATA LOSS / AIS
		0 0 = 16 sec
		0 1 = 33 sec
		1 0 = 66 sec
		1 1 = 260 sec
D5	-	NOT USED
D6	-	NOT USED
D7	-	NOT USED

* Active Low

9. Status Ports

Each circuit supports Status Port 1 which is allocated as follows:-

D0	-	CARD PRESENT (0)
D1	-	PART OF CARD ID (1)
D2	-	SLIP*
D3	-	ALARM 1 (NOT USED)
D4	-	ALARM 2*
D5	-	DATA/CLOCK LOSS*
D6	-	AIS*
D7	-	PART OF CARD ID

* Active Low

10. Indicators

Each circuit supports a single red LED to indicate ALARM 2 and loopback conditions.

11. I/O Connectors

Signal connections are made to the 96 pin DIN 41612 connector as follows. Numbers in brackets refer to connections on the universal I/O adapter DT280 if used:-

CIRCUIT 4 CONTROLLING	RD(B) 32b(50)	RD(A) 32c(25)
	RT(B) 31b(49)	RT(A) 31c(24)
	TT(B) 30b(48)	TT(A) 30c(23)
	TD(B) 28b(46)	TD(A) 28c(21)
CIRCUIT 4 SUBORDINATE	TD(B) 32b(50)	TD(A) 32c(25)
	RT(B) 31b(49)	RT(A) 31c(24)
	TT(B) 30b(48)	TT(A) 30c(23)
	RD(B) 28b(46)	RD(A) 28c(21)
CIRCUIT 3 CONTROLLING	RD(B) 24b(44)	RD(A) 24c(19)
	RT(B) 23b(43)	RT(A) 23c(18)
	TT(B) 22b(42)	TT(A) 22c(17)
	TD(B) 20b(40)	TD(A) 20c(15)
CIRCUIT 3 SUBORDINATE	TD(B) 24b(44)	TD(A) 24c(19)
	RT(B) 23b(43)	RT(A) 23c(18)
	TT(B) 22b(42)	TT(A) 22c(17)
	RD(B) 20b(40)	RD(A) 20c(15)
CIRCUIT 2 CONTROLLING	RD(B) 16b(38)	RD(A) 16c(13)
	RT(B) 15b(37)	RT(A) 15c(12)
	TT(B) 14b(36)	TT(A) 14c(11)
	TD(B) 12b(34)	TD(A) 12c(9)
CIRCUIT 2 SUBORDINATE	TD(B) 16b(38)	TD(A) 16c(13)
	RT(B) 15b(37)	RT(A) 15c(12)
	TT(B) 14b(36)	TT(A) 14c(11)
	RD(B) 12b(34)	RD(A) 12c(9)
CIRCUIT 1 CONTROLLING	RD(B) 8b(32)	RD(A) 8c(7)
	RT(B) 7b(31)	RT(A) 7c(6)
	TT(B) 6b(30)	TT(A) 6c(5)
	TD(B) 4b(28)	TD(A) 4c(3)
CIRCUIT 1 SUBORDINATE	TD(B) 8b(32)	TD(A) 8c(7)
	RT(B) 7b(31)	RT(A) 7c(6)
	TT(B) 6b(30)	TT(A) 6c(5)
	RD(B) 4b(28)	RD(A) 4c(3)

Note: Pin 1a is the bottom left hand pin of the connector viewed from the rear.