



# SIN 150

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## Suppliers' Information Note

*For The BT Network*

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### **BT International KiloStream X.21 bis (56kbit/s)** Service Description

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## **1. Introduction**

This Suppliers' Information Note (SIN) gives details of the facilities provided by the BT International KiloStream X.21 bis (54kbit/s) service.

The KiloStream service enables the exchange of serial binary synchronous data, using point to point private circuits with digital transmission throughout the network. The service incorporates extensive supervisory, alarm, and testing facilities.

This SIN describes the X.21 bis (V.35) interface between the Network Terminating Equipment (NTE) which performs the functions of a Data Circuit-Terminating Equipment (DCE) and the customer's apparatus or Data Terminal Equipment (DTE).

The ITU-T recommendation X.21 bis <sup>[1]</sup> (56kbit/s) interface facilitates full duplex transmission of data at 56kbit/s over the network.

## **2. Service Availability**

BT only offers Kilostream at 56kbit/s as an international service, it is available where network capacity and correspondent agreement exists with other international PTOs.

For service availability with other countries please contact the International Marketing team as given in Section 8.

*Note: BT Kilostream 56kbit/s is not available between sites in the UK*

## **3. NTE Construction**

The NTE consists of a terminating unit which is double-sided printed circuit card that may be housed in one of three ways depending on the customer's requirements.

### **3.1 Main Unit**

Designed for table-top mounting, this unit comprises a plastic housing to accommodate one terminating unit together with a mains power supply unit, line termination, X.21 bis (V.35) interface connector and a front panel mounting for various indicators and switches. This type of housing is suitable for installations where units are individually located or for two or three units together.

### **3.2 Shelf**

The shelf is a metal framework to house up to five terminating units and also contains a mains power supply card and a line test card. The shelf is housed in a plastic cabinet designed for table-top mounting. The cabinet gives front access to the individual terminating unit indicators and switches. The interface connectors are mounted on the rear of the cabinet. This type of housing is for locations where up to five 56kbit/s terminating units may be required in close proximity to one another.

### **3.3 Rack**

The rack is designed to hold up to four fully equipped shelves as described above (i.e. up to twenty terminating units). Again mains power cards, line testing access, interface connectors and access to individual terminating unit controls is provided. This type of housing is for installations where large numbers of terminating units are required together, such as computer rooms.

## **4. KiloStream X.21 bis (V.35) NTE/DTE Interface**

### **4.1 Physical Connection**

The customer's DTE is connected to the NTE regardless of housing by means of a Socket type MRAC 34S-J2 (BS6623:Part 4:1986 <sup>[2]</sup>) or mechanically compatible equivalent. Connector retention is by means of two 6-32 UNC internally threaded bushes.

### **4.2 Interchange Circuits**

Excepting circuit 102, interchange circuits fall into two categories. Some are balanced circuits conforming to ITU-T Recommendation V.35 <sup>[3]</sup>. The remainder are unbalanced circuits with electrical characteristics conforming to ITU-T Recommendation V.28 <sup>[4]</sup>. Table 1 gives details of pin allocations and the electrical characteristic for the various interchange circuits provided. Circuits 141 and 142, although provided on the NTE, are optional in so far as the DTE is concerned.

**Table 1: Connector Pin Circuit Allocations**

ITU-T circuit number	Direction of signalling	Balanced V.35	Unbalanced V.28	Circuit description	PIN allocation	
					A	B
102		-	-	Common return	B	
103	DTE->-DCE	x		Transmit data	P	S
104	DTE-<-DCE	x		Receive data	R	T
105	DTE->-DCE		x	Request to send	C	
106	DTE-<-DCE		x	Ready for sending	D	
107	DTE-<-DCE		x	Data set ready	E	
109	DTE-<-DCE		x	Data channel received line signal detector	F	
114	DTE-<-DCE	x		Transmitter signal element timing Modem Source	Y	AA
115	DTE-<-DCE	x		Receiver signal element timing	V	XX
141	DTE->-DCE		x	Local loopback	L	
142	DTE-<-DCE		x	Test indicator	NN	

## **5. Diagnostic and Test Facilities**

In addition to the supervisory, alarm and test access facilities present within the KiloStream network, a range of diagnostic aids is available to the customer and incorporated within the NTE as a standard feature.

## 5.1 Test Loops for Customer Use

The test loops provided for customer use are loops 3c & 2b of ITU-T Recommendation X.150 <sup>[5]</sup>.

### 5.1.1 Test Loop 3c

When operated, this loop enables the customer to test their DTE together with the interconnecting cable and the NTE interface generators and loads. Operation is either manually by the LOC key on the NTE front panel or remotely via the DTE/NTE interface.

#### 5.1.1.1 Control via Key

In the NORMAL position the LOC key has no effect on the NTE. When operated, loop 3c is applied (Circuit 103 is connected to Circuit 104, and Circuit 105 to Circuit 109). Circuit 142 (Test Indicator) is set to 'ON' and TEST MODE and LOOP ACTIVATED lamps on the front panel are illuminated. Restoring the key to the NORMAL position will remove the loop. The LOCAL LOOP key is inhibited if either Circuit 105 or Circuit 109 is in an 'ON' condition.

#### 5.1.1.2 Control via Interface

A similar action may be achieved when Circuit 141 (Local Loopback) is set to an 'ON' condition by the DTE.

An 'ON' to 'OFF' transition on Circuit 141 will remove the loop.

An 'OFF' condition will have no affect on the NTE.

### 5.1.2 Test Loop 2b

When operated, this loop enables the customer to test the complete circuit excluding the distant DTE and the distant NTE's interface generators and loads. Operation of this loop at the distant NTE is by operating the LB key on the distant NTE.

#### 5.1.2.1 Local Control by Locking Key

Operation of the LB key will cause the NTE to apply loop 2b as specified in 5.1.2.2. In the NORMAL position the key has no effect on the NTE.

#### 5.1.2.2 Action within NTE to supply Remote Loop

Provided Circuit 105 is 'OFF', an NTE required to apply loop 2b will cause the following to occur:-

- a) The TEST MODE and LOOP ACTIVATED lamps will be illuminated. 'OFF' conditions will be set on Circuits 106, 107, and 109. Circuit 104 is clamped to Binary 1 condition.
- b) Signals normally presented on Circuit 104 will be returned to the encoder in place of those from Circuit 103.

## 5.2 Binary Conditions

Two locking keys are provided, one to transmit a continuous Binary 1 condition, the other to transmit a continuous Binary 0 condition. In the NORMAL position, the key has no affect on the NTE.

## 5.3 Testing Indicators

Non-locking key (LT) when depressed causes all indicators to be illuminated to test their operation. Use of this key has no affect on the operational mode selected at this time.

## 5.4 Supervisory Indicators

There is a row of light emitting diodes on the front panel giving indication on the state of the circuit or equipment.

### 5.4.1 Test Mode

Illuminated when any test key is depressed.

### 5.4.2 Fault

Illuminated when one or both of the following conditions exists:-

- received line signal falls below a pre-determined threshold
- NTE can not regain envelope alignment

### 5.4.3 Received Data

Illuminated whenever there is a Binary 1 on Interchange Circuit 104.

### 5.4.4 Received Line Signal Detector

This will mimic the condition on Circuit 109.

### 5.4.5 Ready

This will be illuminated unless one or more of the following conditions exist:-

- Circuit 107 is in an 'OFF' condition
- The received line signal level falls below the threshold
- Uncontrolled Not Ready is being received from line

### 5.4.6 Loop Activated

Will be illuminated when a requested test loop has been successfully implemented.

### 5.4.7 Uncontrolled Not Ready

This will be illuminated when Uncontrolled Not Ready Signal is being received from the line.

## 5.4.8 Additional Light Indications

Lights to signify the following are also provided:-

- Line signal fail
- Envelope alignment fail
- Loss of frame alignment
- Network or distant end fault

## 5.5 Control Functions

Control functions are summarised in Table 2.

**Table 2: Control Functions**

Ref	Stimulus	Response
1.	<i>Quiescent "Ready" State</i> a. circuit 107 'ON' (See ref 6) b. circuit 106 'OFF' (see ref 4) c. all test keys in normal position d. circuit 105 'OFF'	
2.	<i>Normal State</i> circuit 105 'ON'	connect data on circuit 103 to line
3.	<i>Ready for Sending State</i> a. circuit 107 'ON' (see ref 6)  b. circuit 105 'OFF'>'ON'	a. delay following circuit 105 'OFF'>'ON' before circuit 106 'OFF'>'ON' i. delay = 10-20mS; ii. option for delay = 0 b. circuit 106 'OFF'>'ON' at 'OFF'>'ON' transition on Circuit 114
4.	circuit 105 'ON'>'OFF' following action of ref 3.	a. circuit 106 'ON'>'OFF' within 2mS
5.	circuit 107 'ON'>'OFF' following action of ref 3.	a. circuit 106 'ON'>'OFF' within 2mS b. circuit 109 'ON'>'OFF' within 2mS
6.	<i>Data Set Ready Status</i> For normal service:- a. circuit 109 'ON' b. remote loop test not activated c. UNR not received from line	a. circuit 107 'ON'
7.	UNR received from Network following state of ref 6.	a. circuit 107 'ON'>'OFF' circuit 106 'ON'>'OFF' circuit 109 'ON'>'OFF'
8.	Fault condition exists following state of ref 6. Circuit 109 'ON' to 'OFF'.	a. delay 1s $\pm$ 250ms  b. circuit 106 'ON'>'OFF' circuit 107 'ON'>'OFF'
9.	Return to normal service state of ref 6 following action of ref 7.	a. circuit 107 'OFF'>'ON' circuit 109 'OFF'>'ON' circuit 106 'OFF'>'ON'
10.	Return to normal service state of ref 6 following action of ref 8.	a. delay of 0.5s $\pm$ 250ms  b. circuit 107 'OFF'>'ON'

11.	Local Loop Test Key activated	No response if circuit 105 is 'ON' a. connect circuit 103 to circuit 104 b. connect circuit 105 to circuit 109 c. inhibit line signals from affecting circuits 104 and 109 d. transmit BIN 0 to line e. circuit 142 'ON' f. illuminate Test Mode indicator g. illuminate Loop Activated indicator
12.	Local Loop Key deactivated	a. extinguish Test Mode indication b. extinguish Loop Test indicator c. circuit 142 'OFF' d. return to normal operation
13.	Circuit 141 'OFF'>'ON'	No response if Circuit 105 'ON' a. action as for ref 15 except TM LED not lit
14.	Circuit 141 'ON'>'OFF' (assuming Local Loop test key 'OFF')	Disconnect Loop as for ref 16 except TM LED reference
15.	Loopback Key activated	No response if 105 'ON' a. illuminate Test Mode indicator b. circuit 142 'ON' c. illuminate Loop Activated indicator d. circuits 106, 107, and 109 'OFF' e. clamp Circuit 104 to '1'
16.	Restore key to normal position	Return to Quiescent state

## **6. Operating Environment**

Operating ambient temperature	+5 deg to +55 deg C
Relative humidity	90% non-condensing (max) at a temperature range of 20-45 deg C
AC power	240 volts rms -10% to +6%, 45Hz to 55Hz
Power consumption	13 watts (approx) per NTE

## **7. Further Information**

Please contact either:

- Your Company's BT account manager.
- For business customers, BT sales on 0800 800152 for product and service information, sales and rental enquiries.

If you have enquiries relating to this document then please contact: [help@sinet.bt.com](mailto:help@sinet.bt.com)

## **8. References**

[1]	ITU-T Rec. X.21 bis	Use on public data networks of Data Terminal Equipment (DTE) which is designed for interfacing to synchronous V-Series modems	1988
[2]	BS6623:Part 4	DTE/DCE interface connectors and pin assignments. Specification for 34-pin connector	1986
[3]	ITU-T Rec. V.35	Data transmission at 48 kilobits per second using 60-108 kHz group band circuits	1984
[4]	ITU-T Rec. V.28	Electrical characteristics for unbalanced double-current interchange circuits	1993
[5]	ITU-T Rec. X.150	Principles of maintenance testing for public data networks using Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE) test loops	1988

For further information or copies of referenced sources, please see document sources at: <http://www.sinet.bt.com/usenum.htm#docsources>

## **9. Glossary**

<b>CCITT</b>	International Telegraph & Telephone Consultative Committee (now ITU-T)
<b>DCE</b>	Data Circuit-terminating Equipment
<b>DSR</b>	Data Set Ready
<b>DTE</b>	Data Terminal Equipment
<b>ITU-T</b>	International Telecommunications Union - Telecommunication standardisation sector (formerly CCITT).
<b>LOC</b>	LOCAl Loop
<b>LT</b>	Lamp Test
<b>NTE</b>	Network Termination Equipment
<b>PTO</b>	Public Telecommunications Operator
<b>SIN</b>	Suppliers' Information Note
<b>TM</b>	Test Mode
<b>UNR</b>	Uncontrolled Not Ready

## **10. History**

Issue 1.0	November 1988	First Issued.
Issue 1.1	November 2002	Change of editorial format / converted to pdf.
Issue 1.2	December 2003	Approval Requirements statement removed, information available via SINet Useful Contacts page.

**-END-**

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