8100S-RJ8
Installation Guide

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STATUTORY NOTICES

CE 168X

Case Communications Ltd. declare that this product conforms with the protection requirements of the Council Directive of 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic protection.

Case Communications Ltd. declare that this product conforms with the requirements of the European Communities Council Directive of 73/23/EEC on the harmonisation of the laws of Member States to electrical equipment designed for use within certain voltage limits.

This equipment has been tested using shielded DTE cables supplied by Case Communications Ltd. These cables, or equivalents, must be used to ensure compliance with this declaration.

Case Communications Ltd declare that this product conforms with the requirements of the Council Directive of 91/263/EEC on the approximation of the laws of the Member States concerning telecommunications terminal equipment, including the mutual recognition of their conformity covering the following port types:

Port	Public Telecommunications Network(s)
Network Port, fitted with the appropriate cable as specified below:	Private Circuits using interfaces compatible X.25 (1984) using interfaces compatible with X.21 (V.11) or X.21*bis* (V.28) Private circuits using interfaces compatible at the physical layer with X.21 (V.11) or X.21*bis* (V.28)
Interface Type: X.21 (V.11) X.21bis (V.28)	Cable Part Number: X890-408411 X818-401211

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.

Published by Case Communications Technical Publications Department

Preface

This guide provides information for suitably trained engineers to install the Case 8100S-RJ8.

This installation guide should be read in conjunction with the appropriate software product reference manual (for example, 8160) before the installation is attempted.

An existing knowledge of the Case Series 8000 and appropriate terminology is assumed throughout. It is also assumed that the equipment originates from the Case Communications UK factory.

If in doubt, contact your local Case Communications representative, for advice.

Note that all references to the RJ8 Application Card in this guide have the same meaning when applied to the 8100S-Rj8

STATUTORY NOTICES (continued)

APPROVED for connection to telecommunication systems specified in the instructions for use subject to the conditions set out in them.

NS/1282/1/P/604237

FCC WARNING

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

SAFETY WARNINGS

The Safety Status of all interconnection points of cards and/or modules in the 8100S, that are for connection of other equipment, are SELV (as defined by EN60950), and the mains power connector which is defined as 'excessive voltage'.

The protective earth should be in accordance with IEEE wiring regulations and BS6701 Part 1 and 2 (code of practice for installation of apparatus intended for connection to certain telecommunications systems).

LITHIUM BATTERY

The lithium used in the battery of this unit will react violently with water and most gases. Discharged batteries must not be crushed, incinerated or disposed of in the normal waste. Used batteries should be collected and disposed of in an approved land fill. The manufacturer and your local waste authority will provide more detailed information about their disposal.

Accidental charging and short circuiting of the battery may cause overheating and possible rupture.

Replace only with the same or equivalent type recommended by the equipment supplier.

BATTERIE LITHIUM

Attention: Il y a danger d'explosion s'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type recommandé par le constructeur. Mettre au rébut les batteries usagées conformément aux instructions du fabricant.

This installation may only be performed by suitably trained and qualified engineers.

CZECH REPUBLIC SAFETY STATEMENT

Prístroj musí byt umístěn v blízkosti sít'ové zásuvky.
K odpojení přístroje od sítě slouží vidlice sít'ového přívodu.

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1 Introduction

The 8100S-RJ8 is a free-standing unit that complements other Case X.25 products. In this instance only the 8160, 8-port Triple-X PAD software is supported.

The 8100S-RJ8 may be supplied with one of a number of different power supply options:

24 VDC

48 VDC

100-240 VAC

The 8100S-RJ8 card is a functional sub-set of the 8100S, differing only in the presentation of ports 1-8. The RJ8 supports RJ45 connectors instead of the customary uDs of normal 8100S. They are designed to take standard CAT-5 STP 'patch' cables.

The need to provide some degree of 'patching' for V.24 control signals is provided, through the use of user configurable 'handbag-links'.

1.1 Requirements

You will need the following items:

- 8100S-RJ8
- Medium flat-blade screwdriver
- Medium cross-head screwdriver
- This Installation Guide

The 8100S-RJ8 is supplied with a number of cables similar to those detailed below. Check that they are all present (some part numbers may vary for different voltage specifications).

X890-403111	V.24 Composite Cable.
X870-401711	V.24 STP to 25-way D-type Converter (DTE).
X729-40961103	V.24 STP Patch cable (3m).
	Mains Lead (if Mains Powered)

1.2 Physical Description

The 8100S is a free-standing unit in a metal enclosure. It may contain one or two power supply units and an Applications card . (Note that this card is NOT removable from the unit.). The RJ8 Application card is a powerful multi-purpose processor card consisting of a 68000 microprocessor, RAM, battery-backed RAM (BRAM) and application specific EPROMs (Figure 1-1). A small label on the edge plate indicates the software variant. i.e. 8160, etc. The front of the card has two 96-way connectors that mate with the motherboard in the 8100S chassis. The back of each card has eleven connectors (Figure 1-2), made up of a bank of eight V.24 8-way RJ45, two V.24 25-way D-type and one X.21 15-way D-type connectors. These connectors are all accessible from the back of the unit and provide connections to computers, terminals and other similar equipment.

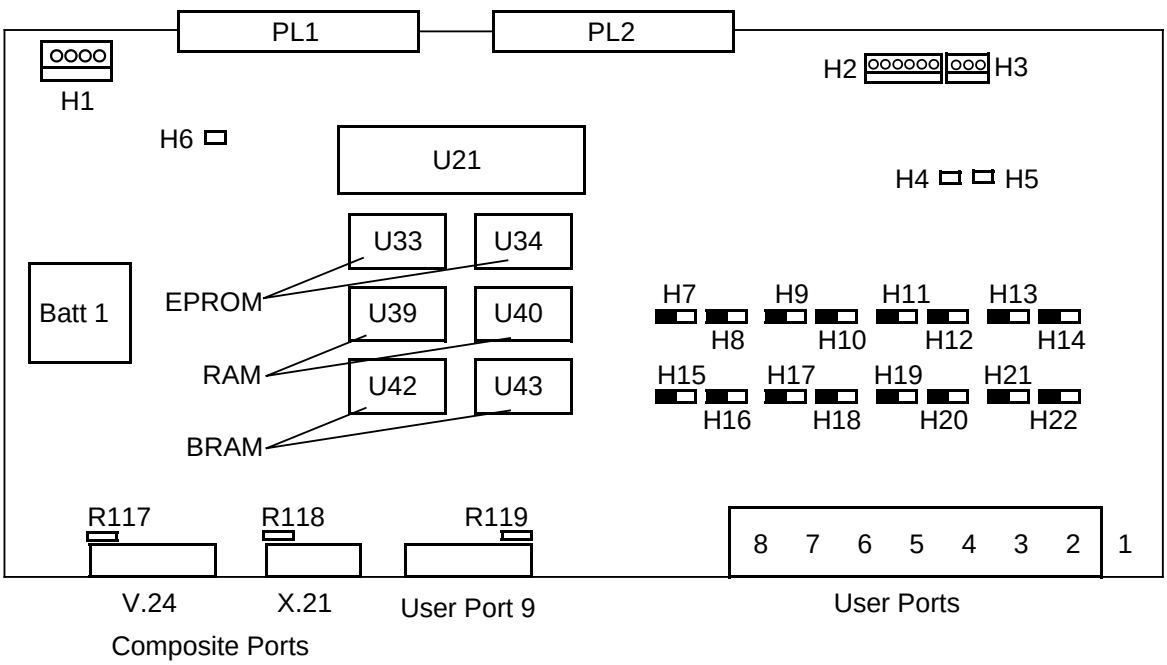


Figure 1-1 RJ8 Application Card (X870-603611)

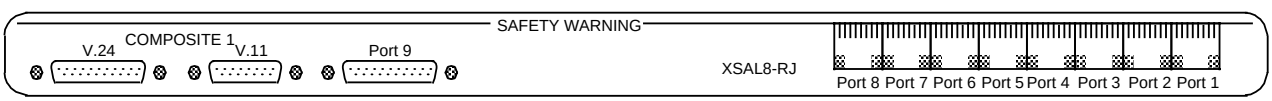


Figure 1-2 RJ8 Application Card Rear Panel (X870-603611)

There are four LED indicators which can be seen through the slots in the front bezel, as shown in Figure 1-3. Between the yellow and red LEDs is a

small round hole. Located through the hole is a small push-button switch used for cold starting the unit (see Chapter 4).

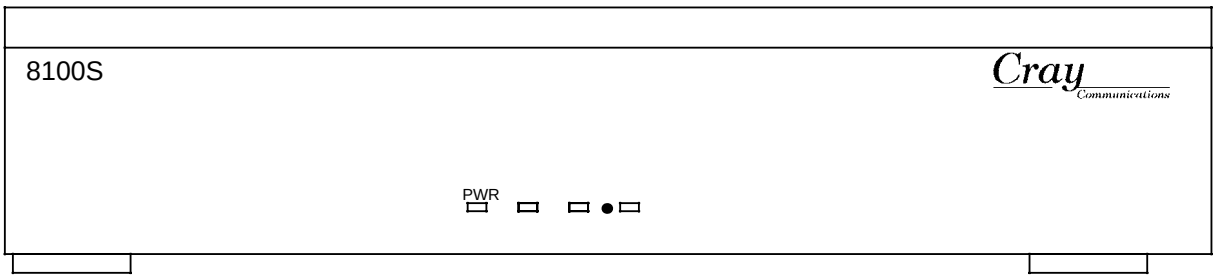


Figure 1-3 8100S-RJ8 Front Panel

Figure 1-4 8100S-RJ8 Rear Panel (Mains Powered)

Figure 1-5 8100S-RJ8 Rear Panel (24V DC Powered)

1.3 Transmission Distances

Table 1-1 illustrates the maximum distances over which RS232-D and V.28 signals can be transmitted through CAT-5 twisted-pair wiring. This is greater than the standard V.24/RS-232 limits, due to the superior performance of the cabling used.

Data Rate	Max. Distance
19.2 Kbps	300 ft (91 m)
9.6 Kbps	600 ft (183 m)
4.8 Kbps	1000 ft (305 m)

Table 1-1 RS-232-D Transmission Distances (CAT-5 Twisted Pair)

It should be noted that both RS-232-D and V.28 are only specified for data rates up to 20 Kbps. The transmission distances are primarily determined by the combined capacitance of the line driver receiver implementation and the interconnecting wiring. The maximum capacitance is 2500 pF.

Normal copper wire has a typical capacitance of 150 pF/metre this normally limits the transmission distance to around 15 metres at 20 Kbps.

1.4 Earthing Point

It is imperative that the structured wiring used to connect RJ45 connectors is provided with a good chassis Earth. This is in all cases provided by the main Earthing points of the chassis assembly, into which the card is installed. See Figure 1-4 and 1-5.

1.5 RJ45 Interfaces

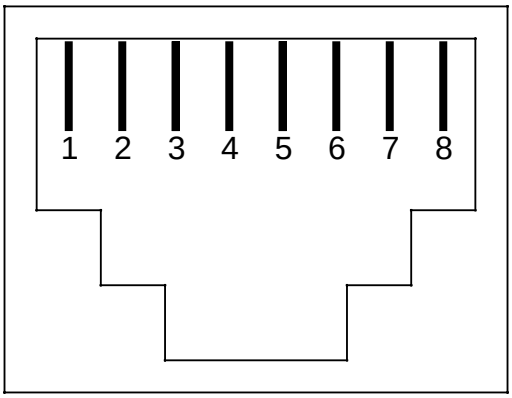
The screened RJ45 connectors used on this design present a standard asynchronous V.24 interface, using V.28 line driver/receivers. This is the same as RS-232-D for the purposes of this design. The product is designed to utilise CAT-5 STP 'patch' cabling, which is a mandatory requirement in order to maintain the EMC performance of the product.

A DTE/DCE interface is determined by the use of appropriate cables and/or adapters, although for purposes of signal direction, a DCE interface is presented here. The limited subset of available V.24 control signals precludes the ability to offer V.54 loopbacks. (A sister product offers this additional functionality, at the expense of replacing the RJ45 connectors with uDs.)

Pin	V.24	RS-232	Pairing	I/O
1	RTS	Request to Send	a	I
2	DSR	Data Set Ready	a	O
3	RXD	Receive Data	d	O
4*	DCD	Data Carrier Detect	b	O
4*	DRS	Data Rate Select		I
5	TXD	Transmit Data	b	I
6*	DTR	Data Terminal Ready	d	I
6*	BO	Busy Out		I
7	SGND	Signal Ground	c	–
8	CTS	Clear to Send	c	O
Shield	FG	Frame Ground	–	–

(* indicate link selectable options on that pin)

Table 1-2 RJ45 Socket Wiring Configuration (DCE)



(Shown when looking into the RJ45 socket as per Figure 1-2)

Figure 1-6 RJ45 Socket Pin Configuration

The pin-out is designed to accommodate the following wiring schemes (Table 1-3):

a) EIA/TIA-568B

b) AT&T 256A

These schemes are all but identical, except that pairs 2 and 3 are interchanged. Both are compatible with ISDN applications.

RJ8 Pin	EIA/TIA-568B	AT&T 256A
1	T2	T3
2	R2	R3
3	T3	T2
4	R1	R1
5	T1	T1
6	R3	R2
7	T4	T4
8	R4	R4

Table 1-3 EIA/TIA-568B and AT&T 256A Wiring Configurations

The scheme is *not* compatible with:

a) TM-0101 System Centre terminal Server.

b) USOC wiring for 1, 2, 3 or 4 pairs.

1.6 Mapping of V.24 Signals

The following signals will be made mappable, via the use of simple 'hand-bag' links on the board, on a 'per-channel' basis as described by Table 1-4. It will be necessary to remove the lid of the unit to alter the settings of these links, (this must only be done with the incoming power source having been previously isolated.)

RJ45 Pin Number	V.24 Signal Name	Where Used
Pin 4	DCD (o/p) DRS (i/p)	3 wire and DTE modes DCE mode
Pin 6	DTR (i/p) BO (i/p)	3 wire and DTE modes DCE modes

Table 1-4 Mappable V.24 Signals

In both cases the supervisor software will advise that when these options are selected in the software the hardware links must be appropriately set.

1.7 Line Termination for Incoming V.24 Signals

All incoming V.24 controls on the RJ45 interfaces, are provided with a simple termination network that will force the signal into an inactive 'OFF' state. This is intended to allow for users who fail to connect to all the RJ8s' incoming control signals. Without this termination, the long lengths of cable used in structured wiring can cause severe crosstalk problems, which can in turn cause software to behave in an erratic manner.

2 Installation

This equipment must only be installed by suitably trained and qualified engineers.

2.1 Preparation

The installation area should be clean, and free from environmental extremes. One unit may be stacked on top of another provided they are in free air which does not exceed 40°C. The unit(s) should be sited so that the indicator lights can be seen. The unit(s) must be installed near to the socket outlet which should be easily accesible.

This chapter makes a number of assumptions about the site.

a) The unit is probably sited in a standard 19" rack.

b) The unit is at a suitable working height.

Note:

There may be a need to open-up the unit to adjust the positions of various hand-bag links. The procedure for doing this will be indicated as necessary.

2.1.1 Other Equipment

Check interfaces between the 8100S-RJ8 and all other equipment which is to be connected (modems, computers, terminals) to ensure compatibility of data and control lines. Details are given in the appropriate 8160 reference manual. Where the flexibility of this product is not sufficient, the changes necessary must be made in the other equipment or the interconnecting cables. Cable specifications are given in Appendices B and C.

2.2 Power Connections

The 8100S supplied may be either AC or DC driven.

2.2.1 Mains Connection

The cable connects to the 8100S unit using a standard IEC 320 connector.

2.2.2 Mains Fusing Arrangements

The 8100S-RJ8 unit is dual-fused: both LIVE and NEUTRAL connections are fused. The IEC 320 cable connector inlet to the 8100S unit incorporates two 2.5 A(T) 250V 20 mm UL listed cartridge fuses.

To replace a fuse first disconnect the mains supply, remove the IEC socket from the unit and use a screwdriver to ease out the panel marked 'FUSE'.

Fuses must only be replaced with the correct type and value, and must not be short circuited.

Note that fuse replacement should only be carried out by qualified personnel.

2.2.3 DC Connection

Connection to the SELV DC supply is made using the integral cable. The cable terminates with stripped/tinned ends. The RED cable should be connected to DC positive (+), and the BLACK to DC negative (-). (Note: The 8100S-RJ8 is not polarity sensitive and will not be damaged by DC polarity inversion.)

2.2.4 DC Fusing Arrangements

The DC powered unit is internally fused with a 1.6 A(T) 250V 20 mm UL listed 20 mm cartridge fuse. To replace the fuse, first isolate the DC input power from the 8100S. Undo the three rear panel screws, slide the lid forward and cleanly lift the lid off. A fuse is fitted to each of the DC/DC Converter PCBs present in the unit.

Fuses must only be replaced with the correct type and value, and must not be short circuited.

Note that fuse replacement should only be carried out by qualified personnel.

Before connection to the DC supply is made, check that the DC voltage rating of the 8100S-RJ8, i.e. 24V, or 48V, matches the voltage of the DC supply (See Figure 1-5).

The DC supply must be SELV (Safe Extra Low Voltage).

2.3 Earthing

This section deals with both Safety and Functional Earthing issues. Section 2.5 deals with Cabling and Frame grounding issues.

2.3.1 Functional Earth

To comply with the EMC requirements for this product, the metal case must be connected to a good earth.

On mains-powered units, the earth connection is provided via the IEC connector and mains cable. No further connection is required.

On DC-powered units, a separate earth connection must be made between the earth terminal (see Figure 1-5) on the rear of the unit, and an earth point provided externally.

An Earthing point is provided for attachment of anti-static wrist bands for service personnel. This connection is provided by a terminal post. On the DC powered variant it is also used for the main EMC earth connection (see Figures 1-4 and 1-5).

See Section 2.3.2.

2.3.2 Safety Earth (DC Powered units only)

An earth is not normally required with DC powered units; however an additional earth lead (GREEN), secured to an internal earth point, is supplied for customer satisfaction.

Note: If the safety earth is used, no additional Earthing (EMC) is required.

Refer to Statutory Notices regarding BS6701.

See Section 2.3.1.

2.4 Preparation of the RJ8 Application Card

Before the 8100S-RJ8 can be installed, some preparation of the RJ8 Application card fitted to the 8100S-RJ8 chassis may be required. This is facilitated by removal of the lid, as described below:

First isolate the input power from the 8100S. Using a medium cross-head screwdriver, undo the three rear panel fixings, slide the lid forward and cleanly lift the lid off.

Refitting is a reversal of this procedure, ensuring that the two locating lugs on the base fit correctly into the slots in the lid, prior to refitting the fixings.

2.4.1 Configuration of Links, H4, H5 and H6

There are a number of links provided on the board which *must* be left in the factory configured setting, where and when the headers are fitted, H4, H5 and H6. In most cases the header strips for the links will not be factory fitted, so this section can be ignored. Where they are fitted, with reference to Figure 1-1, the current settings of your board should be checked against Table 2-2. Any discrepancies should be corrected now.

Link	Description	Setting
H4*	Watchdog Enable	Link removed
–	Watchdog Disable	Link fitted
H5*	No Reset	Link removed
–	Reset Applied	Short link
H6*	No Emulator	Link removed
–	Emulator Fitted	Link fitted

(* indicates Factory Setting, when fitted)

Table 2-1 Link Settings

2.4.2 Configuration of RJ45 V.24 Signals

As indicated in Section 1.5, the RJ8 Application card provides the ability to configure the functionality of two of the pins within each of the eight RJ45 equipped user ports. The configuration is achieved, on a per port basis, by the positions of a pair of 'handbag links', in accordance with Table 2-2.

With reference to Figure 1-1, the appropriate Links may be located on the board.

Links H7-H14 inclusive, control the DTR/BO setting for ports 8 through 1 respectively. The silk screen on the PCB indicates to which port (channel) any particular header applies. A header fitted in the 'Left-most' position (D) will select DTR operation, 'Right-most' (B) will select BO operation. Figure 2-1 illustrates a typical setting for ports 1 and 2 (also shown shaded in Table 2-2):

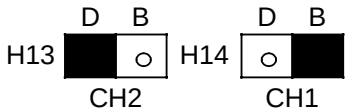


Figure 2-1 Example DTR/BO Link Settings

Links H15-H22 inclusive, control the DCD/DRS setting for ports 8 through 1 respectively. The silk screen on the PCB indicates to which port (channel) any particular header applies. A header fitted in the 'Left-most' (Output) position will select DCD operation as an output, whereas fitted in the 'Right-most' (Input) position it will select DRS operation as an input. Figure 2-2 illustrates a typical setting for ports 1 and 2 (also shown shaded in Table 2-2):

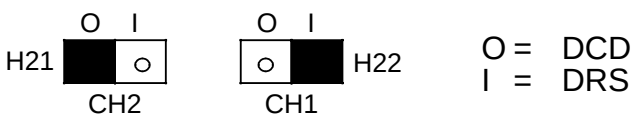


Figure 2-2 Example DCD/DRS Link Settings

Port	Header	Setting	RJ45 Pin	V.24 Signal	Configuration
1	H22	Left (O)	4	DCD (o/p)	3 wire and DTE modes
		Right (I)*		DRS (i/p)	DCE mode
	H14	Left (DTR)	6	DTR (I/p)	3 wire and DTE modes
		Right (BO)*		BO (I/p)	DCE modes
2	H21	Left (O)*	4	DCD (o/p)	3 wire and DTE modes
		Right (I)		DRS (i/p)	DCE mode
	H13	Left (DTR)*	6	DTR (i/p)	3 wire and DTE modes
		Right (BO)		BO (i/p)	DCE modes
3	H20	Left (O)	4	DCD (o/p)	3 wire and DTE modes
		Right (I)		DRS (i/p)	DCE mode
	H12	Left (DTR)	6	DTR (i/p)	3 wire and DTE modes
		Right (BO)		BO (i/p)	DCE modes
4	H19	Left (O)	4	DCD (o/p)	3 wire and DTE modes
		Right (I)		DRS (i/p)	DCE mode
	H11	Left (DTR)	6	DTR (i/p)	3 wire and DTE modes
		Right (BO)		BO (i/p)	DCE modes
5	H18	Left (O)	4	DCD (o/p)	3 wire and DTE modes
		Right (I)		DRS (i/p)	DCE mode
	H10	Left (DTR)	6	DTR (i/p)	3 wire and DTE modes
		Right (BO)		BO (i/p)	DCE modes
6	H17	Left (O)	4	DCD (o/p)	3 wire and DTE modes
		Right (I)		DRS (i/p)	DCE mode
	H9	Left (DTR)	6	DTR (i/p)	3 wire and DTE modes
		Right (BO)		BO (i/p)	DCE modes
7	H16	Left (O)	4	DCD (o/p)	3 wire and DTE modes
		Right (I)		DRS (i/p)	DCE mode
	H8	Left (DTR)	6	DTR (i/p)	3 wire and DTE modes
		Right (BO)		BO (i/p)	DCE modes
8	H15	Left (O)	4	DCD (o/p)	3 wire and DTE modes
		Right (I)		DRS (i/p)	DCE mode
	H7	Left (DTR)	6	DTR (i/p)	3 wire and DTE modes
		Right (BO)		BO (i/p)	DCE modes

(* illustrates Figures 2-1 and 2-2)

Table 2-2 Mappable V.24 Signals

2.5 Data Cabling Considerations

2.5.1 Use of Screened Cables

The use of the specified screened cables is mandatory if Electro-Magnetic Compatibility (EMC) performance is not to be compromised. Refer to the EMC Warning at front of this guide.

2.5.2 RJ45 Cables

All specified cables that connect to RJ45 connectors on this product are high quality fully screened CAT-5 STP specification 'patch' cables. The screen is terminated to the RJ45 shell and thus to rear panel and hence Frame Ground (chassis). The screen is *not* normally connected at the 'D-type' end, when adapters are used. In this case, and whenever alternative cables are utilised, it is the users responsibility to ensure that any connecting cable is suitably screened, in order to maintain the EMC performance.

Appendix B specifies the appropriate cables, and their specified pin-out and wiring details.

2.5.3 D-type Cables (15- and 25-way)

Not all specified cables that connect to conventional 'D-type' connectors on this product are screened. Where screened cables are specified, it is the users responsibility to ensure that any connecting cable is suitably screened, in order to maintain the EMC performance.

Appendix B and C specifies the appropriate cables, and their specified pin-out and wiring details.

2.5.4 Pin 1, Frame Ground to Signal Ground in V.24 and X.21 Applications

Where D-type connectors are provided, at the rear panel(s), for these interfaces, Pin 1 (Frame Ground) is connected to Signal ground through the use of a shorting link (0R resistor). However Pin 1 is not normally connected in specified cables. Where alternative cables are used, the user should seek expert advice, to avoid problems caused by earth-loops created through connections to Pin 1.

Where it is not possible to isolate this connection at any other point in the system then the relevant resistors may be removed. Identify the appropriate port(s), with reference to Figure 1-1:

Composite, V.24, 25-way D-type	R117
Composite, X.21, 15-way D-type	R118
User Port 9, V.24, 25-way D-type	R119

2.6 Connecting Up

Now you can begin the process of connecting the cables to the 8100S-RJ8. The procedure is as follows:

Working from the Rear:

1. Affix the appropriate composite cable.
2. Affix the appropriate User port cables into the RJ45 connectors.
3. It is important that the earth wire fitted to the stud on the rear-panel of the chassis is connected to an appropriate Earthing point.
4. That completes the installation, you are now ready for commissioning.

3 Commissioning

3.1 Indicators

When the unit is powered up, a number of indicators are displayed on the front panel display:

The green LED (leftmost) indicates that DC power is applied.

Status is reflected by the remaining 3 LEDs:

Red	Fault
Yellow	Ready 2
Green	Ready 1

Fault indicator	ON:	Hardware failure
	FLASHING:	Software failure
	OFF:	Normal
Ready 2 indicator	ON:	Power up tests in progress
	OFF:	Normal
Ready 1 indicator	ON:	X.25 link (composite) 'up'
	FLASHING:	X.25 link (composite) 'down'
	OFF:	No power to the card

3.2 Logging On

There are two ways to gain access to the 'Manager', locally, via a local attached terminal or remotely from another X.25 triple-X PAD.

3.2.1 Locally

The method of logging on locally requires a VT100 compatible terminal, which is referred to as the 'supervisor terminal'. Connections to this supervisor terminal from each card should be made using cable X870-401711 (STP patch cable) and a cable as shown in Figure B-2 (RJ45 to 25-way D-type converter).

1. Attach the supervisor terminal to any of ports 1 to 8. The supervisor terminal must have the following attributes:

speed:	1200, 2400, 4800, 9600 or 19k2 bps
data bits:	7 with space parity, or 8 with no parity
stop bits:	1

2. Enter <CR>. A beep should be heard, indicating auto baud rate detect.
3. Enter <CR>. The 8160 will display the banner and give a prompt.
4. Type <logon> and enter <CR>. A password will be prompted for. Enter <CR> again (as there is no default password). The 8160 will then display it's top level menu.

3.2.2 From X.25

The 'manager' of each card may be accessed remotely from any X.25 triple-X PAD. If the X.3 parameters of the remote PAD are configurable then the following values are recommended:

Parameter 2:	0	(echo off)
Parameter 3:	2	(packet forwarding on CR)
Parameter 4:	4	(packet forwarding on time-out)

1. Make a call using an X.121 address that matches the remote manager address. The default subaddress is 99.
2. If no password is configured then the top-level menu will be displayed. Otherwise a password will be prompted for. Enter the correct password followed by <CR>. The top-level menu will be displayed.

3. If the password is incorrectly entered four times, or takes longer than a minute, then the call will be automatically cleared.

4 Cold Starting

The 8100S-RJ8 can be 'Cold started' (provided that the software version fitted to your unit supports cold start). This procedure will return the unit to its' default (factory) configuration state.

1. Disconnect the unit from the mains/DC power supply.
2. Locate the cold start push-button switch through the hole in the front panel between the yellow and red LEDs.
3. Using a small screwdriver, or similar, depress the push-button switch and simultaneously power-up the unit.
4. Keep the switch depressed for ten seconds and then release.

5 Power Supply Failure

Some units may be equipped with a dual power supply. Externally, these units are identical to their single power supply counterparts.

In the event of a PSU failure being detected, the Power indicator (normally green) will flash red.

Furthermore an event may be signalled to any NMC attached to the system. If this happens you should contact your supplier.

The unit can operate indefinitely on the remaining good PSU.

Appendix A Specification Summary

Mains Supply

Input	100-240V ± 10% 0.8 - 0.4A 50-60 Hz 28 Watts maximum
Cable	A cable of approximately 2 metres is supplied fitted with an appropriate mains plug.
Fusing	The main protection are fuses installed in the IEC inlet of the unit. They must only be replaced with devices of the same type and rating. 2.5 A(T) 250V (x2), UL listed Each PSU is also protected by its' own internal fuse. This fuse is not accessible. The unit must be returned to Case Communications for replacement.

DC Supply

Nominal Input Voltage (DC)	24 VDC (18-36) 2.0 A 48 VDC (36-60) 1.45 A
Dissipation	Dual PSU: 35W maximum

Cable	Approximately 2 metres of Flying lead with tinned ends is provided.
Fusing	The main protection are fuses installed in the DC-DC converter module(s), internal to the unit. They must only be replaced with devices of the same type and rating, by a suitably qualified engineer. 2 off 20 * 5 mm cartridge fuses (UL Listed): @24 V - 1.6 A(T) 250 V @48 V - 1.6 A(T) 250 V Each PSU is also protected by its' own internal fuse. This fuse is not accessible. The unit must be returned to Case Communications for replacement.

Operating Conditions:

Operating Temperature:	+5°C to +40°C (-10°C to +40°C on DC powered variants only)
Storage Temperature:	-25°C to +55°C
Humidity:	5% to 95% RH, non-condensing
Altitude:	<3000 m
Atmospheric Pressure:	800-1100 mB
Unit Dimensions (approx.):	Height: 95 mm Width: 430 mm Depth: 380 mm

Weight:
Mass of unit, less external cables: 3.0 Kg

Appendix B Interconnections

All interconnections on the RJ8 Application Card conform to either CCITT V.24/V.28 interface, terminating in either a 25-way D-type or RJ45 connectors; or to CCITT X.21/V.11 interface, terminating in a 15-way D-type connector.

Figure B-1 gives a rough guide to cable requirements.

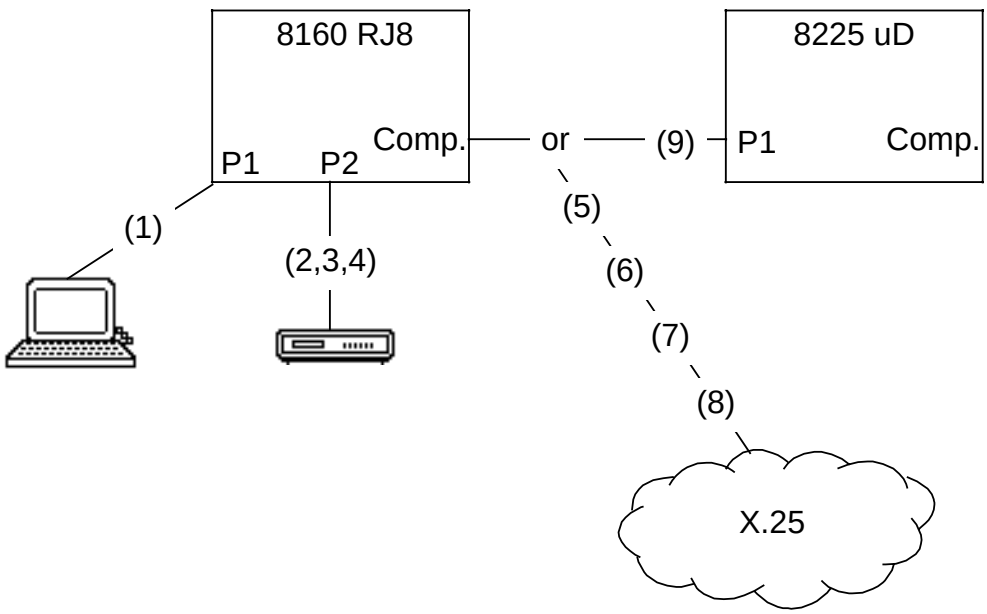


Figure B-1 RJ8 Application Card Cable Connections

For Ports 1-9:

(1) RJ8 Application Card to DTE (e.g. terminals) use cable as shown in Figure B-2, with converter X870-401711, Figure B-3.

(2) RJ8 Application Card to DCE (e.g. Asynchronous modem) use cable as shown in Figure B-2, with converter X870-401911, Figure B-4.

(3) RJ8 Application Card to DCE (e.g. Asynchronous Dial-in modem) use cable as shown in Figure B-2, with converter X870-402011, Figure B-5.

(4) RJ8 Application Card to DCE (e.g. Asynchronous Leased-line modem) use cable as shown in Figure B-2, with converter X870-402111, Figure B-6.

For Composite Ports:

(5) RJ8 Application Card to V.24 DCE use cable X890-403111, Figure B-7.

(6) RJ8 Application Card to V.24 DTE (8160 provides clocks) use cable X890-403011, Figure B-8.

(7) RJ8 Application Card to X.21 DCE use cable X890-401011, Figure B-9.

(8) RJ8 Application Card to X.21 DTE (8160 provides clocks) use cable X818-400511, Figure B-10.

(9) RJ8 Application Card to uD-Application Card ports use cable X890-410311, Figure B-11.

For Kilostream Connections:

Refer to the relevant appendix of the appropriate 8210, 8310 or 8325 Installation Guide.

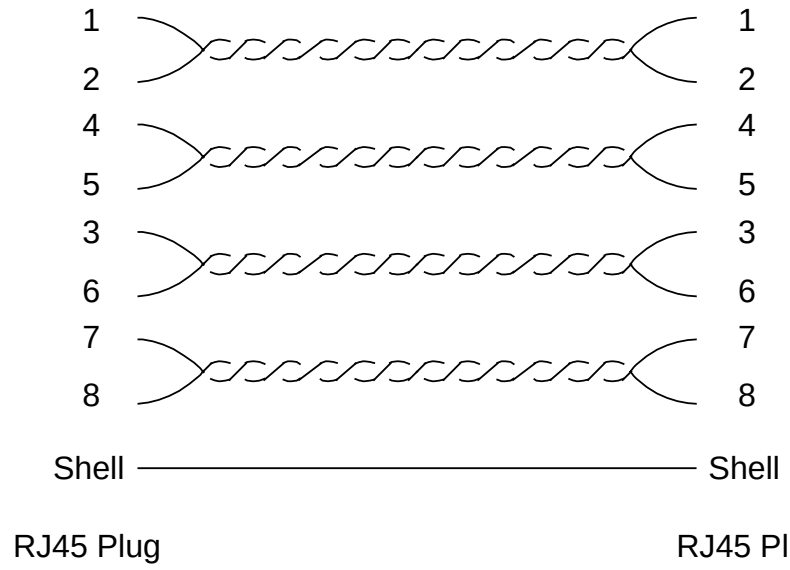


Figure B-2 RJ8 Application Card V.24 STP Patch Cable

Part Number: X729-40961103 (3m)
X729-40961105 (5m)
X729-40961110 (10m)

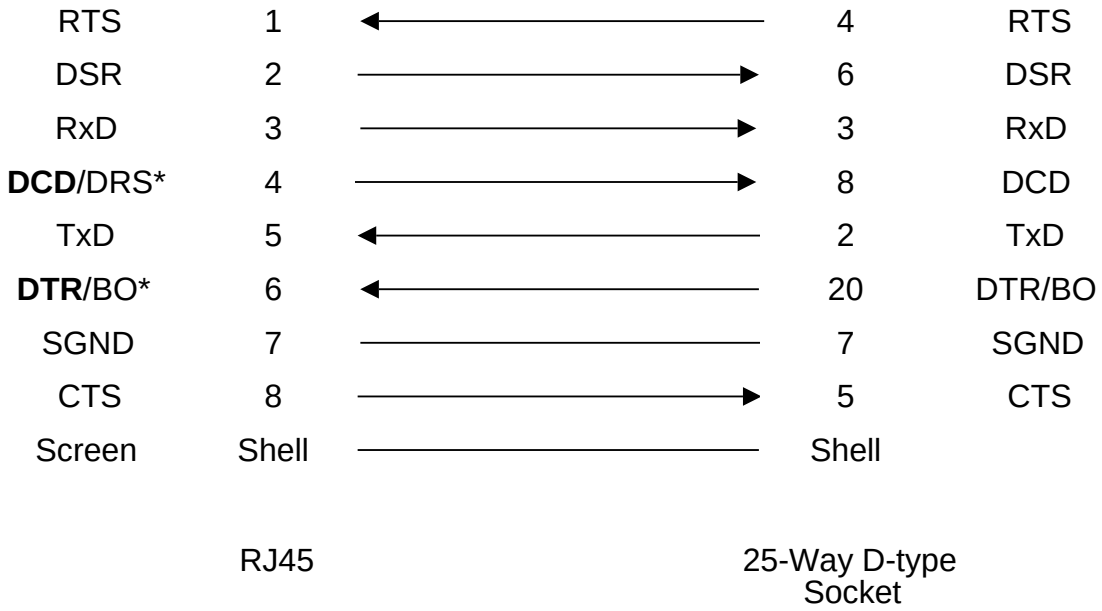


Figure B-3 RJ8 Application Card V.24 STP to 25-way D-type Converter (DTE to Terminal)

Part Number: X870-401711

Note: * assumes the appropriate handbag link selection has been made on the RJ8 Application Card (see Table 2-2).

When used with the 8160 port type 'DTE/3Wire' (using the default link settings for RJ45 pins 4 and 6) it provides connectivity to a typical asynchronous video terminal or printer. For full 8-bit transparency, RTS/CTS flow control may be used, with port type 'DTE'. The terminal DTR control signal should be set in such a way as to always be ON (if this is not possible, then the 'DTE/3Wire' port type must be used, where in-band X-on/X-off flow control must be utilised.).

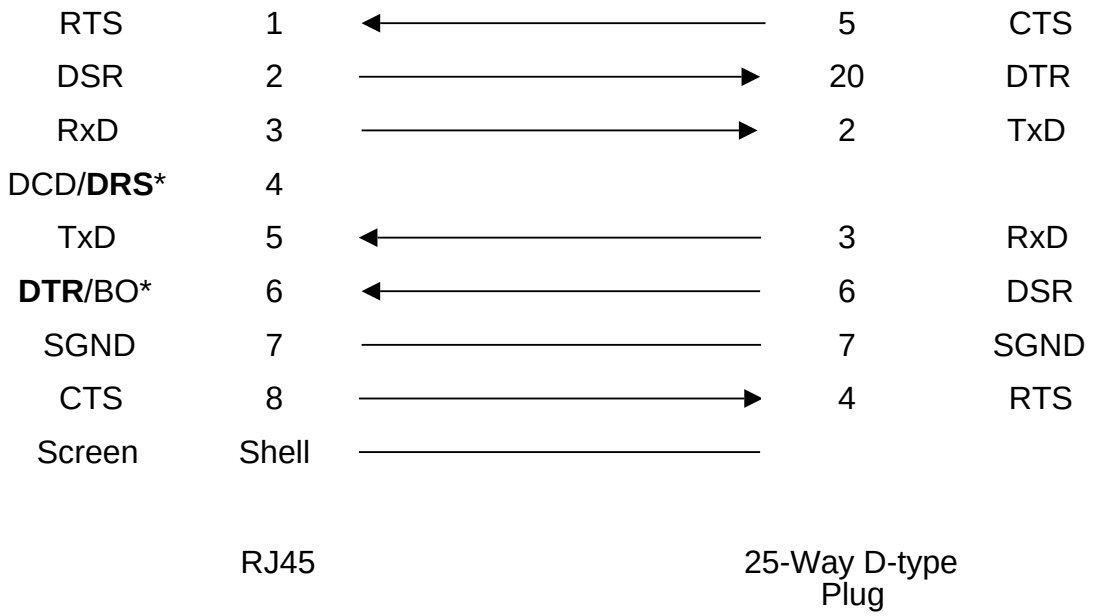


Figure B-4 RJ8 Application Card V.24 STP to 25-way D-type Crossover Converter (DCE to 'Hayes' Modem)

Part Number: X870-401911

Note: * assumes the appropriate handbag link selection has been made on the RJ8 Application Card (see Table 2-2).

When used with the 8160 port type 'DTE/3Wire' (using the default link settings for RJ45 pins 4 and 6) provides connectivity to a typical 'Hayes' type asynchronous modem. This allows dial in/out PSTN calls to be made to/from the X.25 network. For full 8-bit transparency, RTS/CTS flow control may be used, with port type 'DTE', where the modem DSR control signal, should be set in such a way as to always be ON (if this is not possible, then the 'DTE/3Wire' port type must be used, where in-band X-on/X-off flow control must be utilised.) In either case, modem error correction facilities should be utilised.

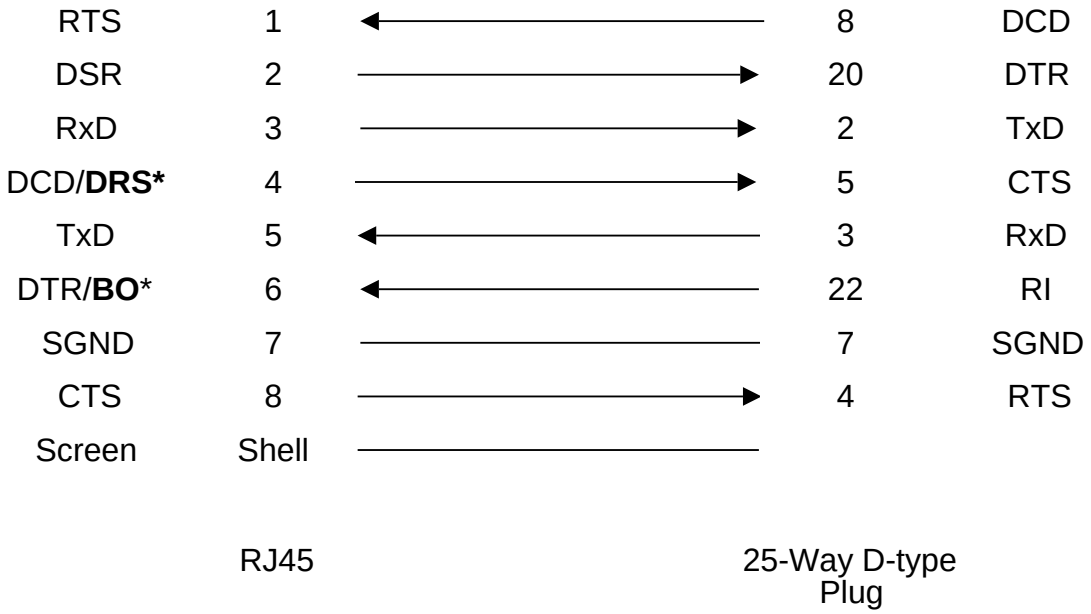


Figure B-5 RJ8 Application Card V.24 STP to 25-way D-type Crossover Converter (DCE to Dial-in Modem)

Part Number: X870-402011

Note: * assumes the appropriate handbag link selection has been made on the RJ8 Application Card (see Table 2-2).

When used with the 8160 port type 'DCE' (using the DRS and BO link settings for RJ45 pins 4 and 6) provides connectivity to a typical asynchronous modem, operating the Connect Dataset to Line (ITU V.24 108.1) protocol. This allows dial-in PSTN calls to be made to the X.25 network, and may be used in conjunction with the 8160 'Auto-call' feature. For full 8-bit transparency, DRS/CTS flow control may be used.

The 8160 'DCE' port type, monitors the modem Ring Indicator (RI) control signal, when recognised as ON the 8160 puts the DTR control signal ON, this in-turn causes the modem to 'pick-up' the PSTN call. Provided that the modem DCD control signal goes ON within the 8160 'DCE/V.54 port - DTR held' time (default is 15 seconds), the 8160 will initiate the 'DCE/V.54-DCD stabilisation' timer (default 2 seconds) – during this period the 8160 will discard any data from the modem. When the modem DCD control has been ON for longer than this stabilisation time, the 8160 bridges any DCD 'dips' (carrier detect drop-outs) shorter than the 8160 'DCE-DCD dip' time (default 2 seconds).

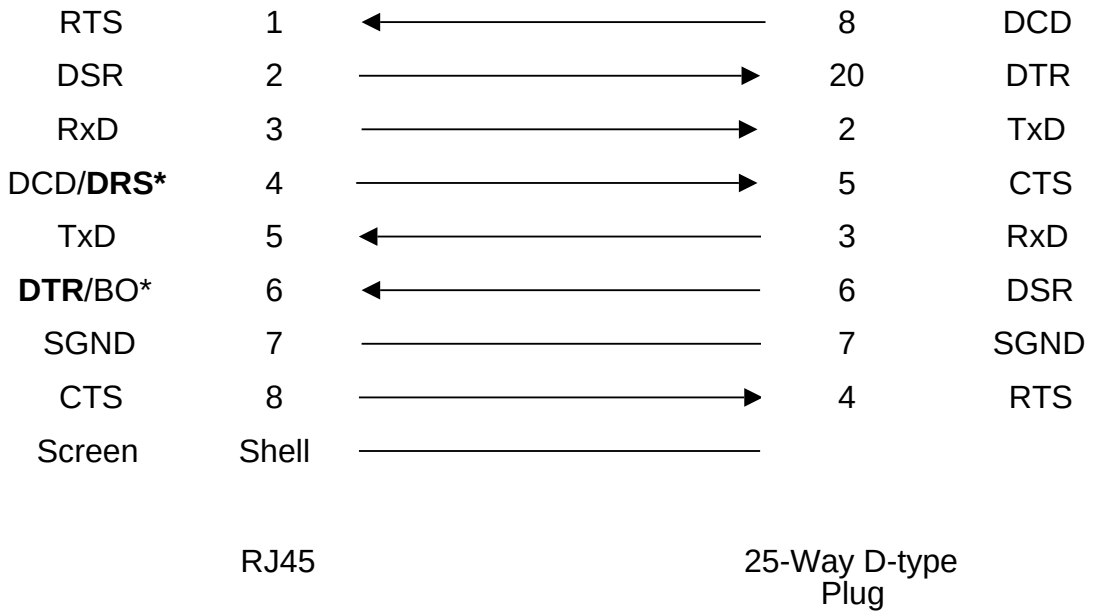


Figure B-6 RJ8 Application Card V.24 STP to 25-way D-type Crossover Converter (DCE to Leased-line Modem)

Part Number: X870-402111

Note: * assumes the appropriate handbag link selection has been made on the RJ8 Application Card (see Table 2-2).

When used with the 8160 port type 'V.54' (using the DRS link setting for RJ45 pins 4) provides connectivity to a typical asynchronous leased/permanent-line modem or line driver. For full 8-bit transparency, DRS/CTS flow control may be used. Additionally, the status of the modem DCD control signal may be reported to a network management centre, when the 8160 'Physical Circuit Events to NMC' port option is enabled.

When the modem DCD control signal goes ON the 8160 will initiate the 'DCE/V.54 - DCD stabilisation' timer (default 2 seconds); during this period, the 8160 will discard any data from the modem. When the modem DCD control has been ON for longer than this stabilisation time, the 8160 bridges any DCD 'dips' (carrier detect drop-outs) shorter than the 8160 'DCE-DCD dip' time (default 2 seconds).

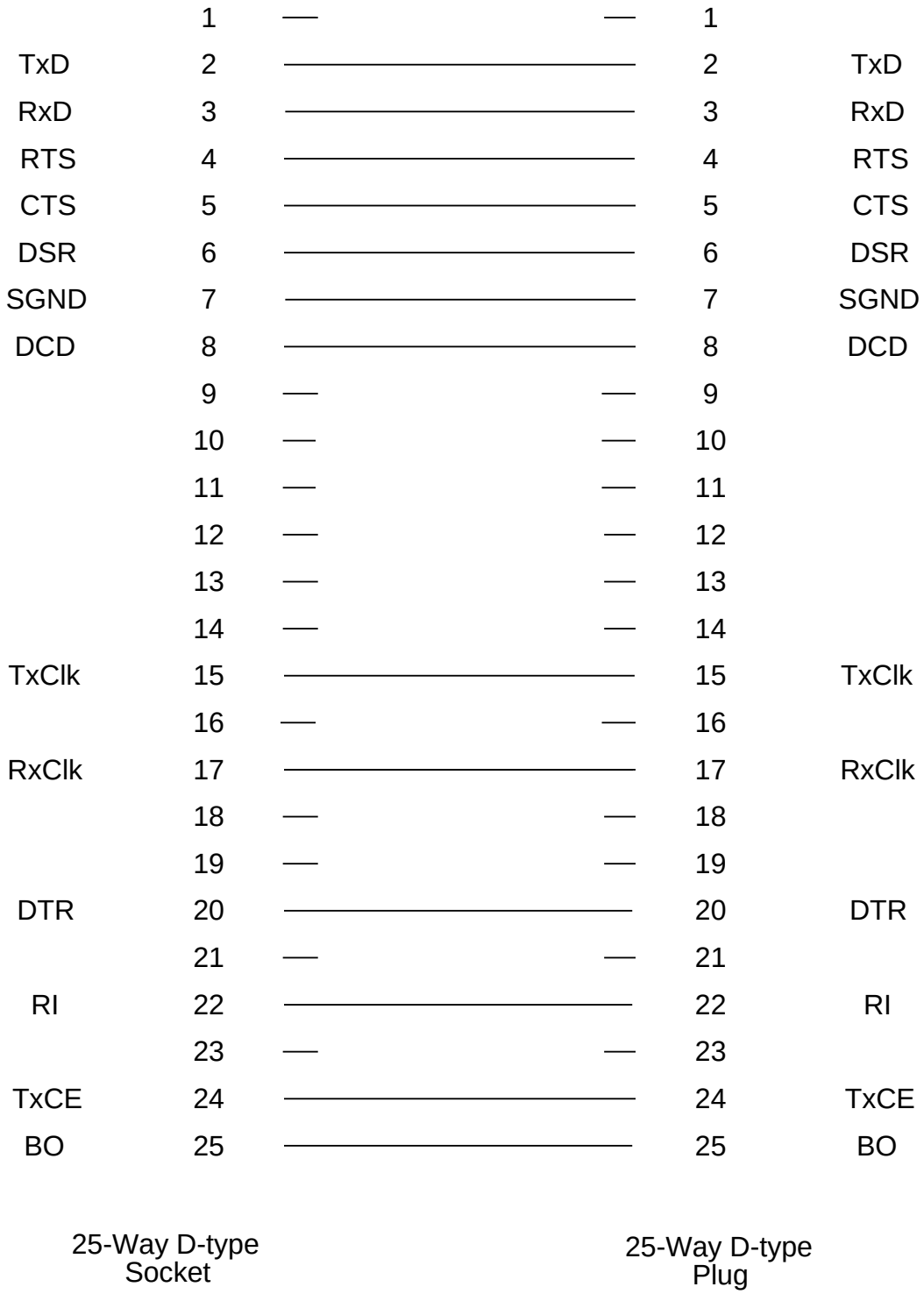


Figure B-7 V.24 Composite Cable (DCE)

Part Number: X890-403111 (3m)
X890-408611 (10m)

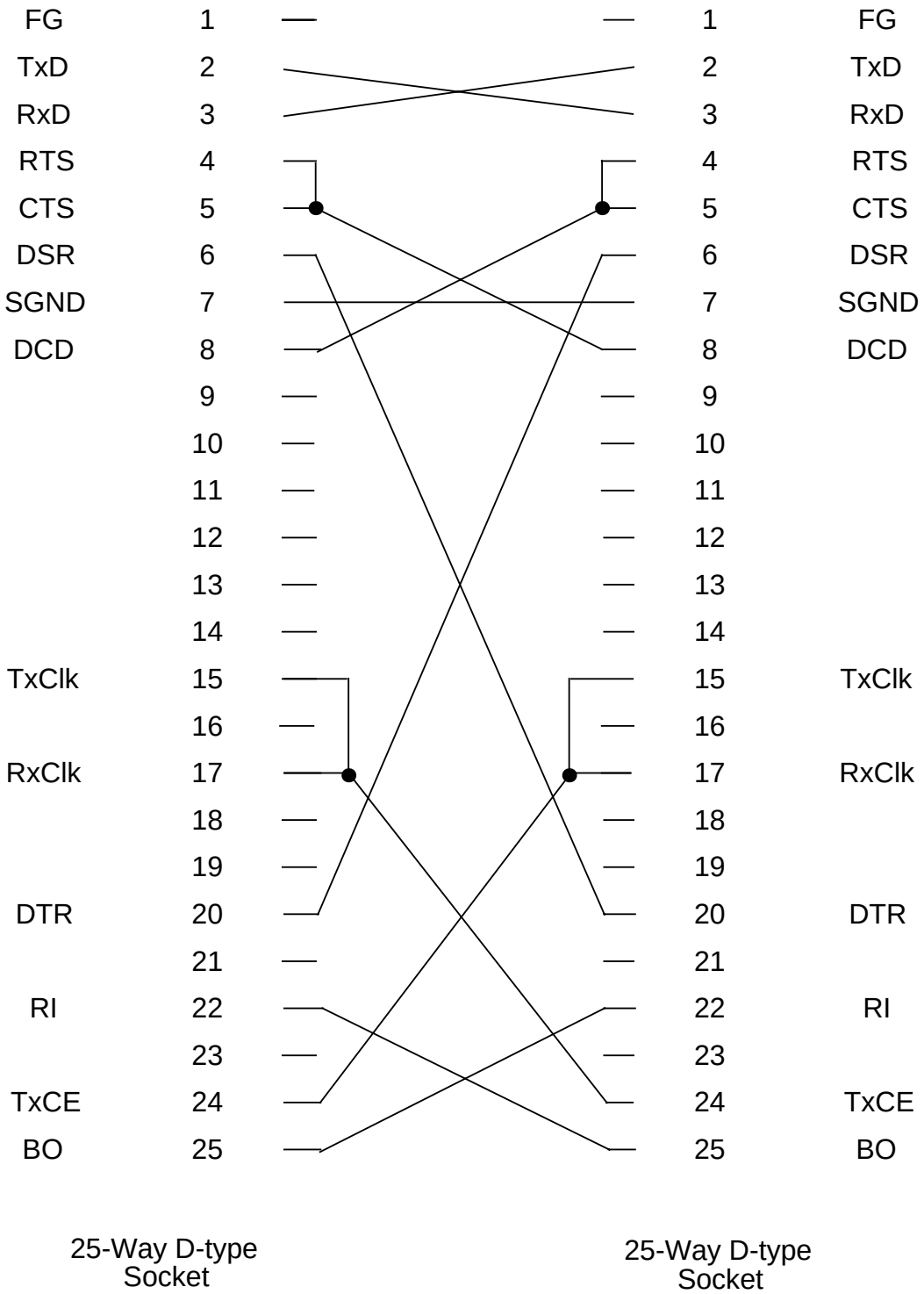


Figure B-8 V.24 Composite Crossover Cable (Ext. Clock)

Part Number: X890-410711 (0.75m)
X890-403011 (3m)
X890-408711 (10m)

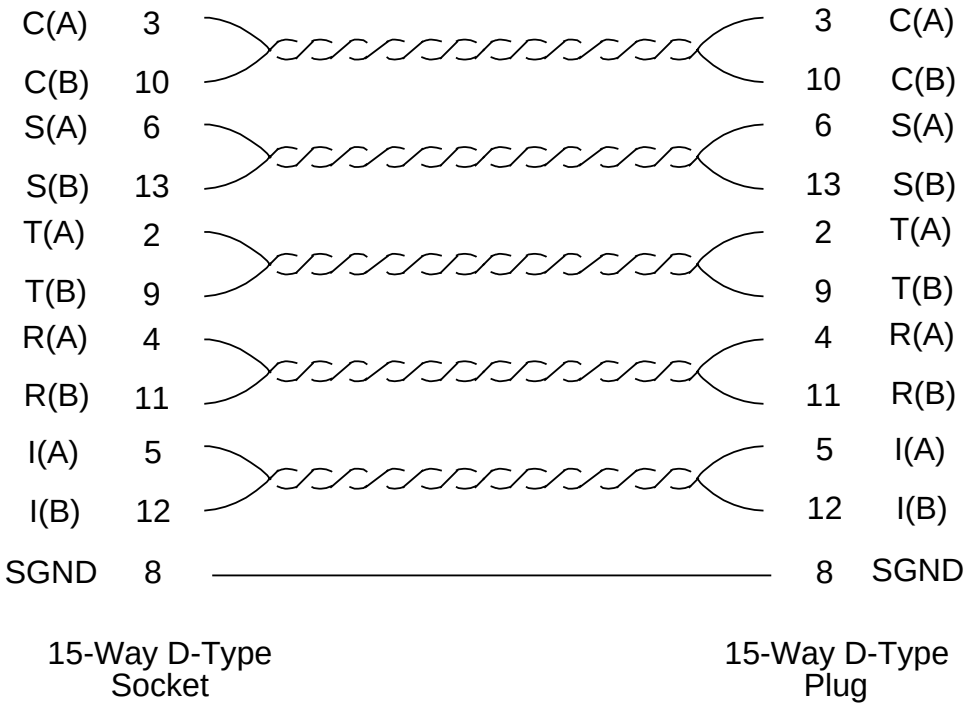


Figure B-9 8160 to X.21 DCE Composite Cable

Part Number: X890-410611 (0.75m)
X890-401011 (3m)
X890-408811 (5m)

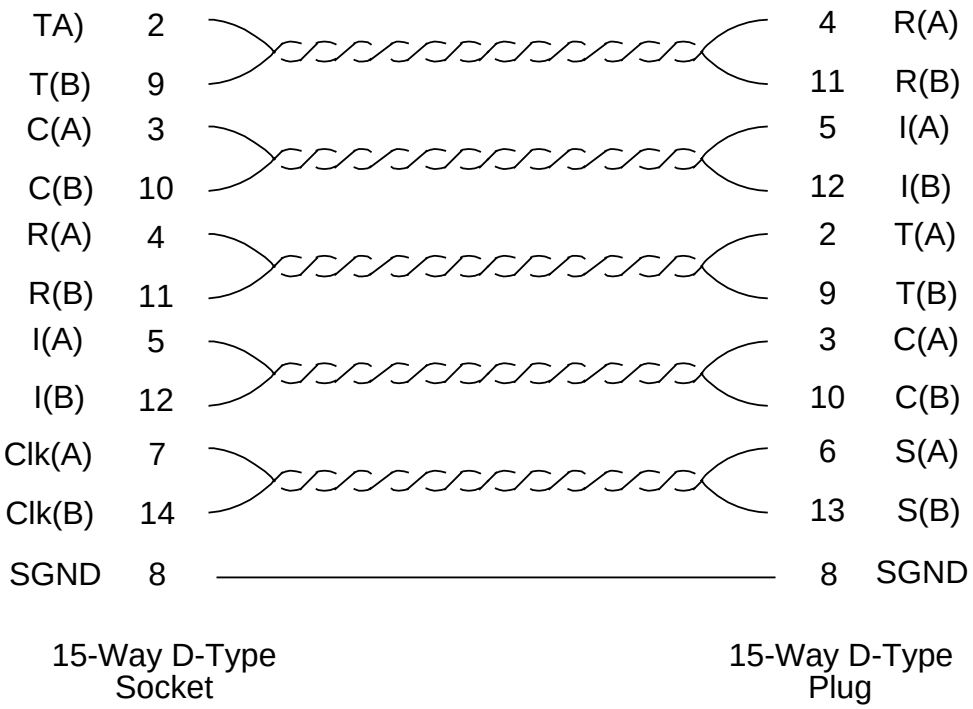


Figure B-10 Composite to X.21 DTE Composite Cable

Part Number: X818-400511 (3m)

Note:
This cable is not symmetrical, the 8160 generates clock on pins 7 and 14.

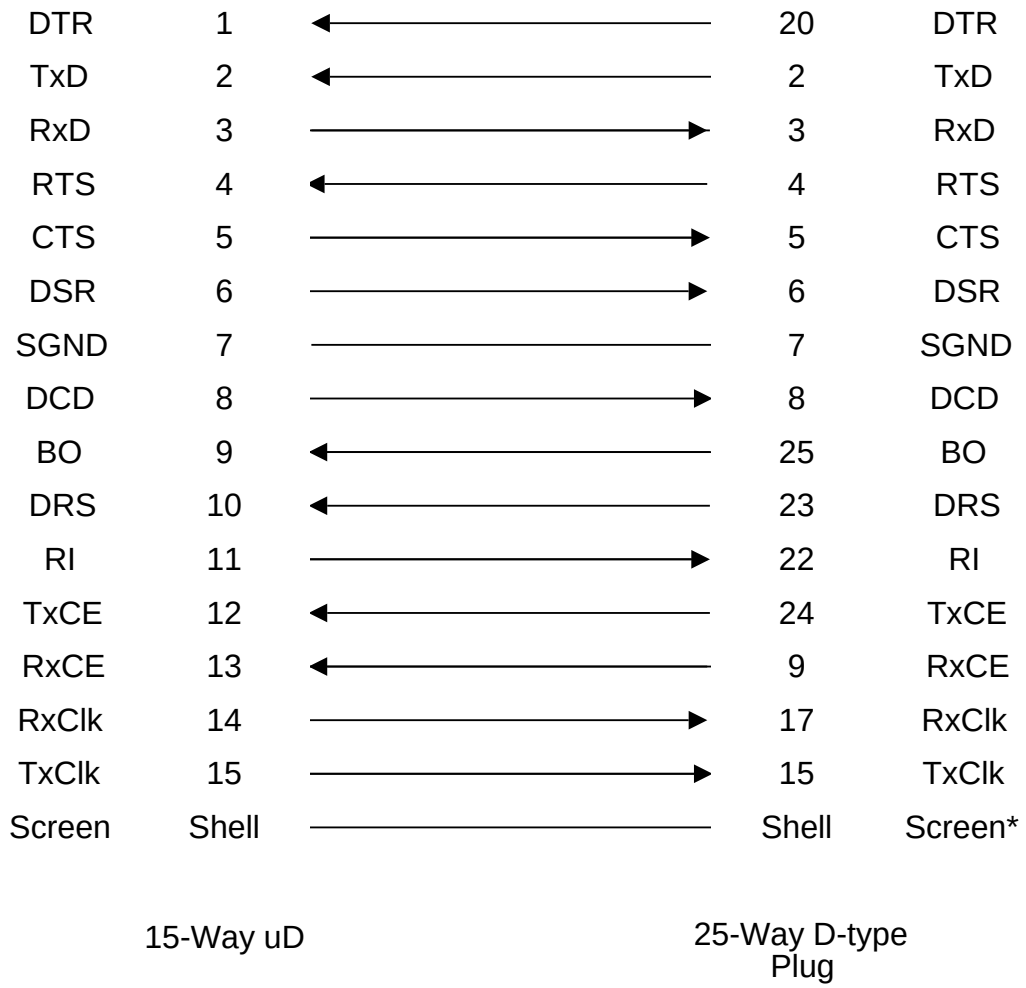


Figure B-11 Application Card V.24 Interconnect Cable (uD)

Part Number:	X890-410311	(0.75m)
	X890-409911	(3m)
	X890-410011	(5m)
	X890-411111	(Stub Cable)

* X890-411111 Stub cable only, (screen is unterminated at the D-type end on all other cables).

Appendix C UK PSS and KiloStream

C.1 General

In order to meet the safety requirements of our PSS/KiloStream approval it is important to make sure that the equipment is correctly installed and maintained.

When delivered from the factory for use in the UK the physical interfaces of ports which can be connected to PSS and KiloStream are given in Table C-1.

Interface	Line Speed	Connector Type	Cable Part Number
V.24	<=19K2 bps	25-way D-type male (DTE)	X818-401211
X.21	<=64K bps	15-way D-type male (DTE)	X890-408411

Table C-1 Permissible UK PSS/KiloStream Connections

Connection to PSS and KiloStream NTUs must be made with the cables specified in Table C-1 which must be installed by a competent engineer.

C.2 NET1 Considerations

In order to comply with NET 1, this product provides 'DTE Uncontrolled NOT READY' protocol on the X.21 composite interface. This protocol may fail to operate satisfactorily at line speeds below 4800 bps.

All V.24 and X.21 composite interfaces are approved for direct connection to digital networks using cables X818-401211 and X890-408411 respectively.

All V.24 interfaces can only operate up to 9600 bps for PSS connection, but up to 19200 bps for KiloStream connection.

All V.24 composite interfaces are for connection to PTO service category 1.

C.3 NTU Pin Assignments

The pinout tables C-2 and C-3 show the V.24 and X.21 interface pin assignments presented to a PSS/KiloStream NTU at the NTU end of the cables specified in Table C-1. For the pinouts at the 8100s-RJ8 end of the cables refer to Figures C-1 to C-3.

Pin No.	Direction	Assignment
2	output	TXD (Transmit Data)
3	input	RXD (Receive Data)
4	output	RTS (Request To Send)
5	input	CTS (Clear To Send)
6	input	DSR (Data Set Ready)
7	–	SGND (Signal Ground)
8	input	DCD (Data Carrier Detect)
15	input	TxC (Transmit Clock)
17	input	RxC (Receive Clock)
20	output	DTR (Data Terminal Ready)

Table C-2 V.24 Interface Pin Assignments (At NTU End of Cable X818-401211)

Pin No.	Direction	Assignment
3	output	CA (Control)
10	output	CB (Control)
6	input	SA (Signal Element Timing)
13	input	SB (Signal Element Timing)
2	output	TA (Transmit Data)
9	output	TB (Transmit Data)
4	input	RA (Receive Data)
11	input	RB (Receive Data)
5	input	IA (Indication)
12	input	IB (Indication)
8	–	SGND (Signal Ground)

Table C-3 X.21 Interface Pin Assignments (At NTU End of Cable X890-408411)

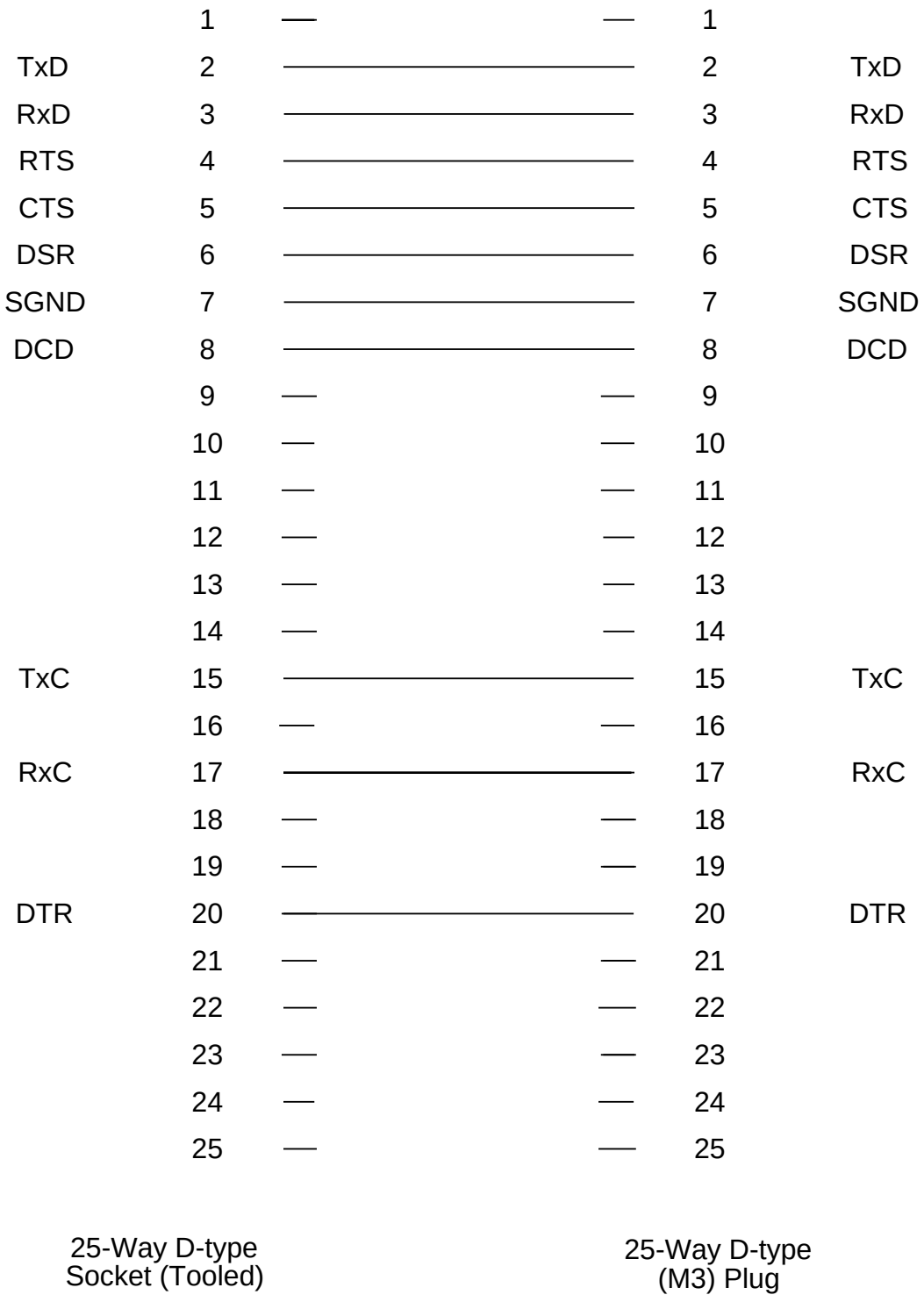


Figure C-1 V.24 PSS/KiloStream Cable X818-401211

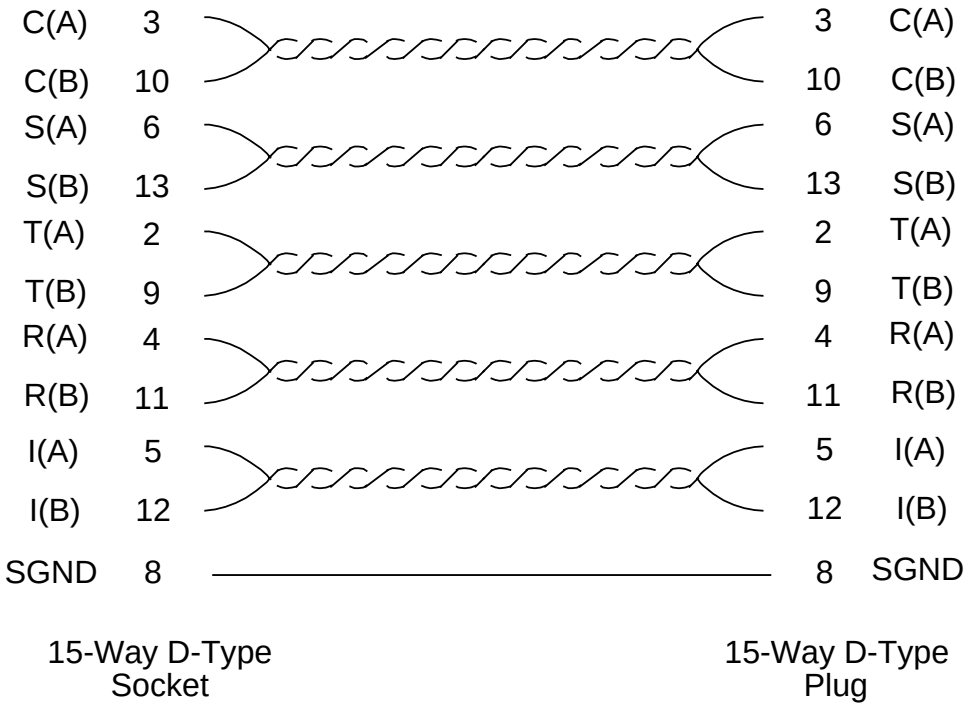


Figure C-2 X.21 PSS/KiloStream Cable X890-408411

From DTE	From DCE	Mnemonic	Definition
1	1	PGND	Protective Ground
2	–	TxD	Transmitted Data
–	3	RxD	Received Data
4	–	RTS	Request to Send
–	5	CTS	Clear to Send
–	6	DSR	Data Set Ready
7	7	SGND	Signal Ground
–	8	DCD	Received Line Signal Detector (Data Carrier Detect)
–	15	TxClk	Transmission Signal Element Timing
–	17	RxClk	Receiver Signal Element Timing
20	–	DTR	Data Terminal Ready
–	21	BO	Signal Quality Detector (Busy Out)
–	22	RI	Ring Indicator
–	23	DRS	Data Signal Rate Select
24	–	TxCE	External Transmission Signal Element Timing

Table C-4 RS-232 Signal Naming Convention for DTE and DCE Ports