PART No. 5500040-16

LINKSTREAM
Installation Guide

Copyright © Perle Systems Ltd, 2002.
No part of this document may be copied without written permission from
Perle Systems.

The Perle policy is one of continuous development and consequently the equipment may vary in detail from the description and specification in this publication.

SECTION ***TABLE OF CONTENTS*** **PAGE**

1.0 GETTING TO KNOW YOUR LINKSTREAM

Documentation	4
Introduction stand alone/rack mount	4
Package contents	4
LINKSTREAM construction	5
Front panel display	5
Reset button	6
Rear panel connections and switch	6
Optional upgrades	7
ISDN2e terminal adaptor	7
User channel expansion card	7
Voice over IP	7

2.0 CONNECTING TO YOUR LINKSTREAM

Power and console connection	8
User channel connection	8
Modem cable	8
Modem controls	9
ISDN connection	9
Serial link connection	9
Ethernet (LAN) connection	10
Ethernet interface/links	10

3.0 COMMAND LINE INTERFACE 11

4.0 CONFIGURING YOUR LINKSTREAM

Quick setup	12
Cold start	14
Accessing management screens	14
Node manager screen structure	16
Statistics screen structure	17
Manual configuration	18
Internet parameters	19
Domain name server configuration	19
Ethernet configuration	20
ISDN call parameter	21
PPP interface - LCP/PAP parameters, IPCP parameters	22
Configure session parameters, System reset	23

5.0 GENERAL INFORMATION

Approvals/RFC list	24
Specification	25

This Installation/User Guide has been designed to assist in the installation of LINKSTREAM in standard configurations. If the more advanced features of the LINKSTREAM are required then the *LINKSTREAM Range Reference Manual* is available. Please contact your supplier for details.

ACKNOWLEDGEMENTS

**Ethernet* is a registered trademark of XEROX*

***KILOSTREAM* and *MEGASTREAM* are registered trademarks of BT plc*

***VT100* is a registered trademark of Digital Equipment Corporation Inc.*

GETTING TO KNOW YOUR LINKSTREAM

DOCUMENTATION

This User Guide gives quick set up information. For more detailed information, the *LINKSTREAM Range Reference Manual* is available.

INTRODUCTION STAND ALONE

The LINKSTREAM is a stand alone product combining the functions of a terminal server and router in the same unit. It consists of a metal case with an internal power supply with 8 asynchronous ports. In addition, there is an Ethernet port and two WAN interface connections.

FUNCTION

The LINKSTREAM function is primarily that of a distributed data switch working at both the wide and local area network level. LINKSTREAM combines a host of features providing the user with two high speed link ports to access remote local area networks, eliminating the need for additional bridges and routers. The two high speed link ports operate at speeds up to 2Mbps enabling the user to perform remote terminal multiplexing accommodating Nx64K digital services.

LINKSTREAM is supplied in packaging specially designed to prevent damage during transit. It is important that the contents are checked against the list below BEFORE installing. In the unlikely event of a damaged or missing item please contact your supplier.

PACKAGE CONTENTS

1 x LINKSTREAM unit
1 x Mains cable
1 x User Guide
1 x Console cable

LINKSTREAM CONSTRUCTION

The LINKSTREAM consists of a stand alone case of metal construction with an internal power supply. Up to two expansion cards can be fitted to provide additional user channels, up to a maximum of 24.

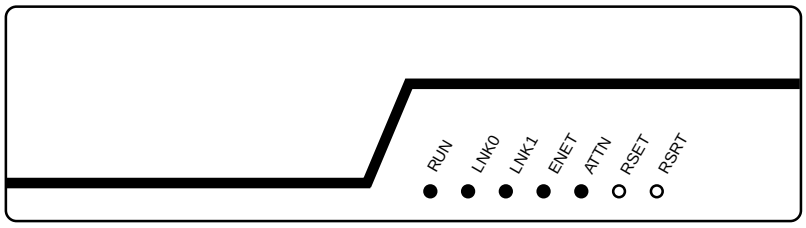
The unit is supplied as standard with the following features:

2 x Serial (WAN) ports
8 x Asynchronous user channels
3 x Ethernet LAN ports 10Base5, 10Base2 and 10BaseT.

Optional upgrade modules are available and are detailed later in this section.

The front panel of the unit is shown below.

Figure 1
LINKSTREAM front panel



FRONT PANEL LED DISPLAY

RUN
A green LED which flashes at a constant rate of approx. once every second. This indicates that the power is applied, all self checks are completed and the unit is running normally.

LNK0
A green LED which flashes to show data transfer over Link0. When data transfer ceases, the LED may be left in the ON or OFF condition.

LNK1
A green LED which flashes to show data transfer over Link1. When data transfer ceases, the LED may be left in the ON or OFF condition.

For data transfer over the ISDN the appropriate link LED will be permanently on.

ENET
A green LED which flashes to show data transfer over the Ethernet interface. When data transfer ceases the LED may be left in the ON or OFF condition.

ATTN
An amber LED which when illuminated indicates that a fault is present or has occurred during system operation. If lit, please contact your supplier for assistance. If unable to do this, the fault may be due to a corruption in the unit's configuration and it is advised that a cold start is activated and the unit re-configured.

FRONT PANEL BUTTON

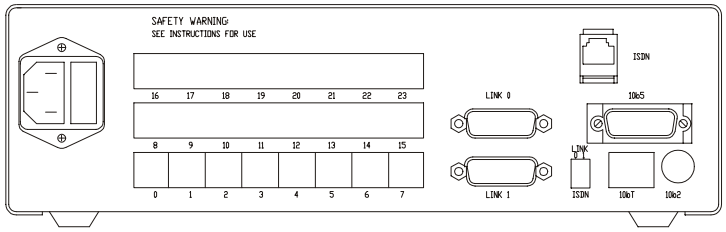
There are also two recessed push buttons on the front panel:

RSET This performs a 'warm start' to the system in that it clears down all queues and restarts the system with existing configuration parameters.

RSRT This button is used to perform a full 'cold start' and is used in conjunction with RSET.

The rear panel of the unit provides for all connections to the unit.

Figure 2
LINKSTREAM rear panel



REAR PANEL CONNECTIONS

Connections are:

- **Mains Power Inlet**
  110-240V socket outlet to be nearby and accessible.
- **0 - 23**
  Up to 24 user channels, 8 on the base unit and 8 on each expansion card.
- **LINK 0**
  Serial WAN link.
- **LINK 1**
  Serial WAN link.
- **ISDN**
  ISDN2e Terminal Adaptor
- **10b5, 10b2, 10bT**
  Ethernet interfaces for the various types of Ethernet connection.

See page 9 for optional upgrades.

REAR PANEL SWITCH

This rear panel switch selects the serial link and ISDN interface.
Select 'ISDN' for ISDN.
Select 'LINK' for serial link connector.

OPTIONAL UPGRADES LINKSTREAM - ISDN2e Terminal Adaptor
8 Channel expansion card
Voice over IP card

INTEGRAL ISDN2e TERMINAL ADAPTOR

Configured automatically or manually, one or both of the WAN links can be replaced with an ISDN interface running at 64Kbps on each link. The module is plugged into rear socket on the LINKSTREAM.

LINKSTREAM switch settings
This rear panel switch is for each serial link
Select 'ISDN' for ISDN.
Select 'LINK' for serial link connector.

The ISDN function within LINKSTREAM has been designed to offer the same operation to the user whether the internal ISDN module is installed or an external Terminal Adaptor is connected to the LINK0 or LINK1 interface.

USER CHANNEL EXPANSION CARD

Stand alone and rackmount units are supplied with 8 user channels. Up to 24 user channels can be supported by the addition of LINKSTREAM expansion cards. These are ordered separately and are fitted by the user.

VOICE OVER IP

The LINKSTREAM VIP card provides 2 compressed voice/ fax channels for IP networks.

CAUTION

INSTALLATION OF MODULES SHOULD BE CARRIED OUT BY QUALIFIED SERVICE PERSONEL ONLY.

CONNECTING TO YOUR LINKSTREAM

POWER CONNECTION

On power up, the LEDs on the front panel illuminate while the LINKSTREAM performs system checks. Once successfully completed the RUN LED flashes at a constant rate (approx. once every second).

If the RUN LED does not flash at a constant rate, or the ATTN LED is on, then do not continue with the installation. Contact your supplier for advice.

CONSOLE CONNECTION

Connect the RJ45 end of your console cable into any of the user channels. Connect the other end of the console cable into the serial port of your computer or terminal, tighten the locating screws where applicable.

To make up your own console cable the RJ45 socket pin outs are detailed in the 'User Channel Connection' section, below.

USER CHANNEL CONNECTION

The user channel RJ45 sockets present asynchronous V.24/V.28 as a DCE with the following pin outs :

LINKSTREAM RJ45		Terminal DB25	Function
1	<<--	4	RTS
2	<<--	20	DTR
3	<<--	2	TXD
4	-->>	8	DCD
5	-->>	3	RXD
6		7	GND
7	-->>	6	DSR
8	-->>	5	CTS

Please ensure that user channel cables do not exceed V.24/ V.28 (RS232) recommended lengths or data corruption can occur.

MODEM CABLE

The following cable specification is typical to allow bidirectional modem access. We recommend that you check with your modem manual to ensure that the specification is suitable.

LINKSTREAM		Path	Modem DB25	
RTS	1	<<--	22	RINGIN
DTR	2	<<--	5	CTS
TXD	3	<<--	3	RXD
DCD	4	-->>	20	DTR
RXD	5	-->>	2	TXD
GND	6		7	GND
CTS	8	-->>	4	RTS

MODEM CONTROLS

The user channels on LINKSTREAM have 5 control lines for modem access, 3 outputs (DCD, DSR, CTS) and 2 inputs (RTS, DTR). The 2 inputs are monitored for call status whilst 2 outputs (DCD and CTS) are used by LINKSTREAM to control access. DSR is permanently 'ON' by being tied high through a resistor.

LINKSTREAM is capable of working in 3 different modes with a modem to suit every application :

1. Initiate call only (Dial Out)
2. Receive calls only (Dial In)
3. Bidirectional calls (Dial In/Out)

This User Guide only deals with bidirectional call set up. Full details of configuration for each mode are available in the *LINKSTREAM Range Reference Manual.*

ISDN CONNECTION

An optional ISDN2e Terminal Adaptor (TA) can be installed in LINKSTREAM. This can be used to replace one or both of the WAN links with an ISDN interface running at 64Kbps on each link.

We recommend that you configure your LINKSTREAM *before* connecting the TA or serial link cable. The ISDN cable is supplied with the TA. A second serial link cable can be ordered separately for connection to a NTU.

V.35 SERIAL LINK

The following cable is used to connect to V.35 DCEs.

LINKSTREAM 15-way D plug	DCE: MRAC 345-J2	Function
2	P	TXD-A
9	S	TXD-B
4	R	RXD-A
11	T	RXD-B
3	C	RTS
8	B	Ground
5	F	DCD
1	Y	TXC-A
7	AA(a)	TXC-B
6	V	RXC-A
13	X	RXC-B
14	U	TXC(Ext)-A
15	W	TXC(Ext)-B

V.24/V.28 SERIAL LINK

The following cable is used to connect low speed X.21bis Kilostream or a modem with a V.24 interface.

LINKSTREAM 15-way D plug	Modem: 25-way D plug	Function
2	2	TXD
4	3	RXD
3	4	RTS
8	7	Signal Ground
5	8	DCD
1	15	TXC
6	17	RXC
14	24	TXC(Ext)

NOTE:

The 15-way D socket uses UNC 440 retention screws.

ETHERNET CONNECTION

We recommend that you configure your LINKSTREAM before connecting the Ethernet port.

Care should be taken when connecting the Ethernet port of the LINKSTREAM to your network. Ensure that you follow the usual precautions as laid down in the Ethernet guidelines. If unsure of connection procedures for Ethernet then contact your supplier for advice.

ETHERNET INTERFACE

10Base5, 10Base2 and 10BaseT interfaces are provided on the stand alone LINKSTREAM although only one may be used at any time. Failure to observe this will corrupt the data and prevent correct operation. Selection of the interface is by use of the 6-way multi-coder between column pairs as set out below:

LINKS

10BaseT RJ45 Link columns A-B (factory default).
10Base2 BNC Link columns B-C
10Base5 15 way D Link columns C-D

COMMAND LINE INTERFACE

INTRODUCTION

The LINKSTREAM presents a Command Line Interface to the user when attached to any of the channels. The unit is activated by pressing any key and will respond with

Welcome to LINKSTREAM

LINKSTREAM >

The user is then able to enter any of the commands in response to the system prompt. The commands can be entered in lower or upper case and can be abbreviated to just the highlighted letters identified. 'Space' or TAB can be used to separate commands and arguments. The Backspace and Delete keys are operational to edit lines.

The Command Line Interface also gives the user access to the Node Manager resident in the local unit or in any other LINKSTREAM on the network.

A summary of the commands is given below.

Command	Arguments	Description
Close	<session>	Close a specific connection
Help		Show help page
LOCk		Lock current port
LOGin	<host> <port>	Log in to configuration manager
LIsten		Put current port into 'Listen' state
Open	<host> <port>	Open a transparent connection
Ping	[forever] <host>[t]	Send ICMP Ping requests
PPp		Start PPP on this port
Quick		Start quick setup Menu
Resume	<session>	Resume a specific session
SEnd	<code><sess>	Send Telnet code (BRK/IP/AO/AYT/EC/EL)
SHow	<[sess][names][map][arp][panic]>	Show Telnet sessions or Name Server table
SLip		Start SLIP on this port
Telnet	<host> <port>	Open a Telnet connection
Version		Display TCP version number
Xping	[forever]<host>[t]	Send IPX ping requests

QUICK SETUP

The following steps provide basic configuration information to enable you to get started. For more detailed information and 'fine-tuning', refer to the *LINKSTREAM Range Reference Manual.*

Quick Setup Worksheet

Product Type
Site Name
Prepared by **Date**

It is advisable to fill out this worksheet before attempting to configure a LINKSTREAM using the Quick Setup Menu.

1. IP traffic only? yes___/no___
   If no, then Quick Setup cannot be used.

2. Leased Line? yes___/no___
   If no, then Quick Setup cannot be used.

3. Network Address of directly attached Ethernet ___.___.___.___
   Subnet Mask of directly attached Ethernet. ___.___.___.___/none

4. Unique IP Address assigned to LINKSTREAM ___.___.___.___

5. Active RIP to be used on all network ports? yes___/no___

6. Default Gateway to be defined? yes___/no___
   If yes, what is the address? ___.___.___.___

7. Type of Serial Link0 addressing numbered ___/unnumbered ___
   If numbered, what is the IP address? ___.___.___.___
   What is the subnet mask? ___.___.___.___ /none ___

   Type of Serial Link1 addressing numbered ___/unnumbered ___
   If numbered, what is the IP address? ___.___.___.___
   What is the subnet mask? ___.___.___.___ /none ___

8. Voice Port0 enabled? on___/off___
   Voice Port0 Type: Tie___/FXO___/FXS___
   Voice Port0 Remote IP Address: ___.___.___.___
   Voice Port0 Remote Port ___

   Voice Port1 enabled? on___/off___
   Voice Port1 Type: Tie___/FXO___/FXS___
   Voice Port1 Remote IP Address: ___.___.___.___
   Voice Port1 Remote Port ___

   Voice Port2 enabled? on___/off___
   Voice Port2 Type: Tie___/FXO___/FXS___
   Voice Port2 Remote IP Address: ___.___.___.___
   Voice Port2 Remote Port ___

   Voice Port3 enabled? on___/off___
   Voice Port3 Type: Tie___/FXO___/FXS___
   Voice Port3 Remote IP Address: ___.___.___.___
   Voice Port3 Remote Port ___

1. Cold start the LINKSTREAM. This will clear any pre-existing configuration and will put the unit in a known state of default values.

2. Connect a terminal or PC running a suitable VT100 emulator package such as Procomm or Hyperterminal, set to 9600 baud, 8 data bits, 1 stop bit, to the LINKSTREAM console port. Activate the console port by typing <cr> so the LINKSTREAM> prompt appears.

3. Type Quick followed by a <cr> to enter the Quick Setup Menu.

4. Enter the default password, which is 6 full stops: . . . . . .<cr>

5. When prompted for the Ethernet IP address, enter the value from the worksheet. Note that an Ethernet IP Address must be entered.

6. When prompted, enter the Subnet Mask. If subnetting is not being used, accept the default value which is automatically set to 255.255.255.0 for class C addresses.

7. To set Serial Link 0 with unnumbered IP addressing:
   Serial Link0 Enable (on/off) [off]: on <cr>
   Link0 Numbered or Unnumbered IP [numbered]:
   unnumbered <cr>

8. If Serial Link1 is not used,
   set Serial Link1 Enable (on/off) [off]:<cr>

9. If the worksheet states RIP is enabled, RIP (on/off) [off]: on <cr>

10. If the worksheet states no default gateway,
    Default Gateway (x.x.x.x) [none]: <cr>

11. Voice Port0 is used, and is connected to Port0 of the remote LINKSTREAM.
    Voice Port0 (on/off) [off]: on <cr>
    Port0 Type (Tie/FXO/FXS) [tie]L Tie <cr>
    Port0 Remote IP Address (x.x.x.x) [0.0.0.0:192.168.2.45
    Port0 Remote Port (0-3) [0]: 0 <cr>

12. If Voice Port1 is not to be used, Voice Port1 (on/off) [off] <cr>
    If Voice Port1 is required, configure as above.

13. When prompted, save these changes and reboot (yes/no) [no]: yes <cr>
    The 'Saving settings' message will be displayed and dots will appear as the parameters are stored. Within a few seconds the LINKSTREAM will restart, and be ready for operation.

    The configuration can now be 'fine-tuned' if necessary by using the management screens.

CONFIGURING YOUR LINKSTREAM

CONFIGURATION

This section gives a brief overview of the LINKSTREAM using the Node Manager. Full details of all configuration screens are given in the *LINKSTREAM Range Reference Manual*.

COLD START

The LINKSTREAM can be completely restarted using the cold start mechanism.
NB This will remove all the user-entered configurations and return all parameters to their default values.

A cold start is carried out as follows:
i) Hold in the 'RSET' and 'RSRT' buttons.
ii) Release the 'RSET' button.
iii) Release the 'RSRT' button.

The unit will then restart. All the front panel LEDs will illuminate for approximately 10 seconds. They will then all go out except for the RUN LED which will remain flashing.

ACCESSING CONFIGURATION MANAGEMENT

Attach a VT100 type terminal or PC running VT100 emulation to any of the user channels.The management port is activated by pressing any key and will respond with:

Welcome to LINKSTREAM

LINKSTREAM >

Enter the command **LOG** <CR> (local unit)
or the command **LOG** with IP address <CR> (remote unit).

The LINKSTREAM will respond with the Log-on screen (see *Fig.1* below).

Figure 1
Log-on screen

```
Node : No Name                LINKSTREAM version x.x

                        Log On
                        =======

          User Identity : ..........
          Password :


SYSTEM MSG : Enter user Identity
```

To log-on, enter the user identity (up to 8 characters) and the correct password. The default values are:

User Identity : manager
Password : ..... (six full stops)

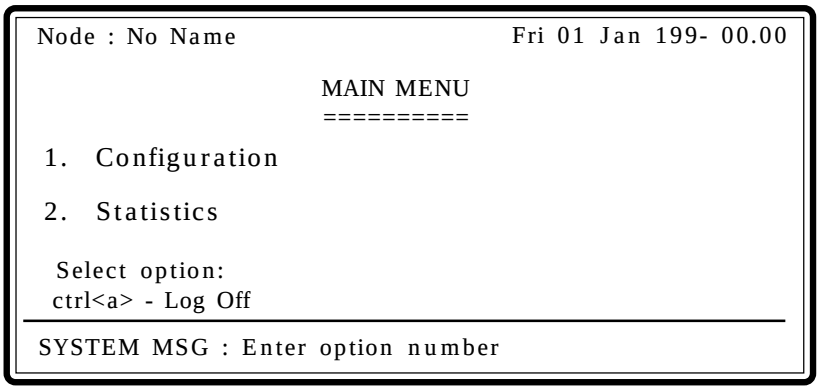


Figure 2
Main menu screen

A number of control characters are used to perform specific functions, independent of the screen currently displayed.

CTRL-X invokes the main menu from any other screen as long as the user is logged in.
CTRL-Y returns the user from the current menu to the previous menu in the sequence.
CTRL-A used as a log-off command which is effective from all screens. On entry of the character, the system will return to the command line prompt.
CTRL-Z moves the cursor to the last configurable field on the screen.

Two characters are used to move through multiple pages of data such as routing tables. They are therefore only active on certain screens.

CTRL-F go **F**orwards to next page.
CTRL-B go **B**ackwards to the previous page.

Other control characters, specific to certain screens, are described in the *LINKSTREAM Range Reference Manual.*

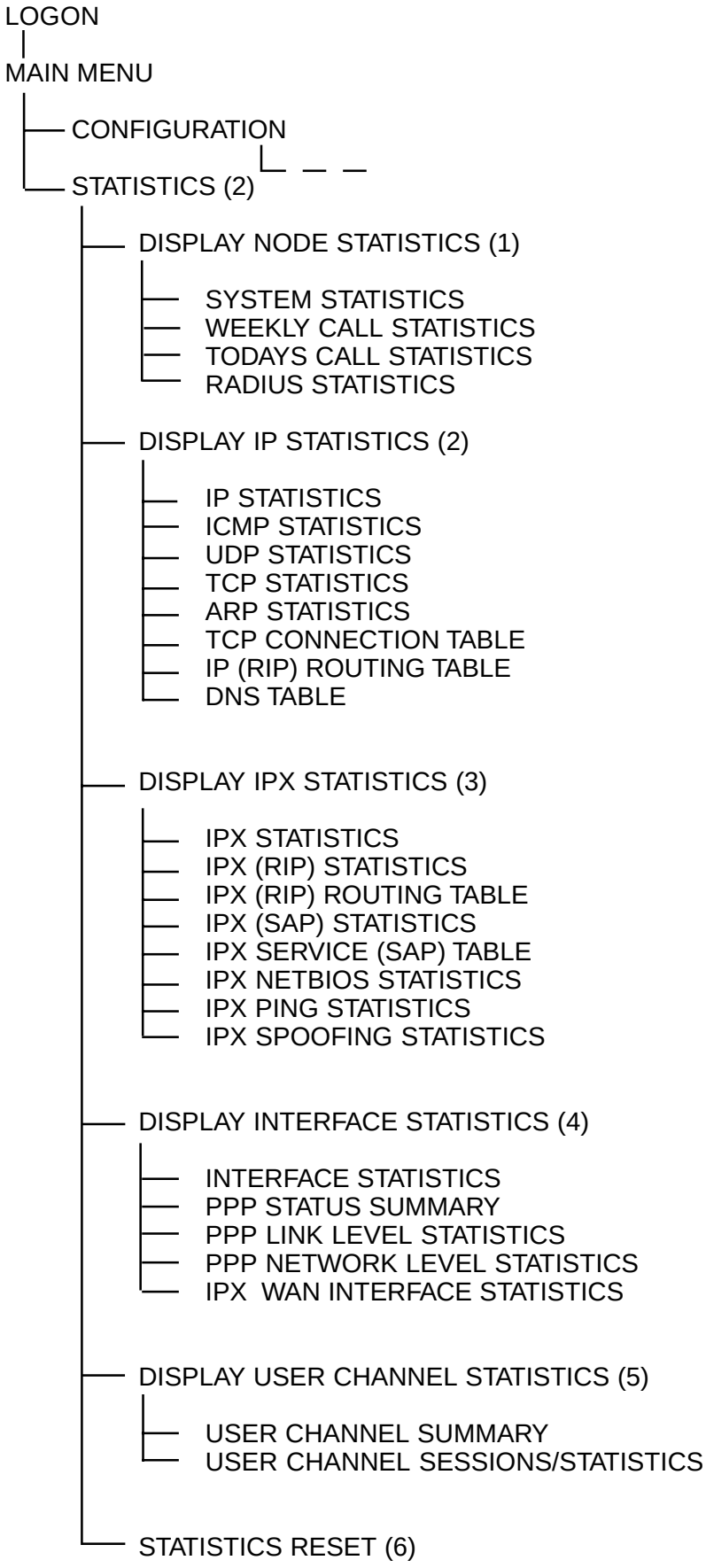
GENERAL INFORMATION

NODE MANAGER SCREEN STRUCTURE CONFIGURATION

The diagram below gives the overall structure of the screens within the Node Manager, showing the pathways through the system.

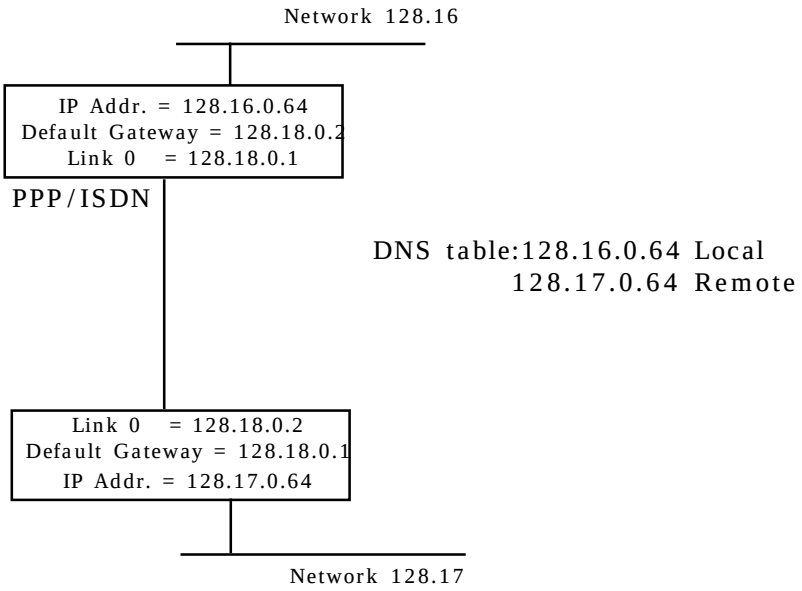
- LOGON
  - MAIN MENU — **Page no.**
    - CONFIGURATION (1)
      - SYSTEM CONFIGURATION (1)
        - NODE SYSTEM PARAMETERS
        - USER IDENTITIES AND PASSWORDS
        - USER AUTHENTICATION TABLE
        - USER MENU
        - ISDN CALL MANAGEMENT TABLE
        - UPLOAD/DOWNLOAD CONFIGURATION
        - SNMP CONFIGURATION
        - RADIUS CONFIGURATION
      - INTERNET PROTOCOL CONFIGURATION (2)
        - SYSTEM INTERNET PARAMETERS **19**
        - IP STATIC ROUTING TABLE
        - DOMAIN NAME SERVER PARAMETERS **19**
        - DOMAIN NAME SERVER TABLE
        - IP FILTER TABLE
        - IP AUTOFORWARDING TABLE
      - IPX PROTOCOL CONFIGURATION (3)
        - SYSTEM IPX PARAMETERS
        - IPX STATIC ROUTING TABLE
        - IPX STATIC SERVICES TABLE
      - NETWORK INTERFACE CONFIGURATION (4)
        - ETHERNET INTERFACE PARAMETERS **20**
        - SERIAL LINK INTERFACE PARAMETERS
        - ISDN/MODEM CALL PARAMETERS **21**
        - PERLE LINK PARAMETERS
        - PPP-LINK LCP /PAP PARAMETERS **22**
        - PPP-LINK IPCP PARAMETERS **22**
        - PPP-LINK IPXCP/IPXWAN PARAMETERS
        - PPP-MULTILINK PARAMETERS
        - SLIP INTERFACE PARAMETERS
      - CHANNEL CONFIGURATION (5)
        - CHANNEL INTERFACE PARAMETERS
        - CHANNEL SESSION PARAMETERS **23**
        - CHANNEL STRINGS CONFIGURATION
        - RESET/COPY CHANNEL PARAMETERS
        - VOICE CONFIGURATION
      - SYSTEM RESET (6) **23**
    - STATISTICS

NODE MANAGER SCREEN STRUCTURE STATISTICS -Continued



MANUAL CONFIGURATION

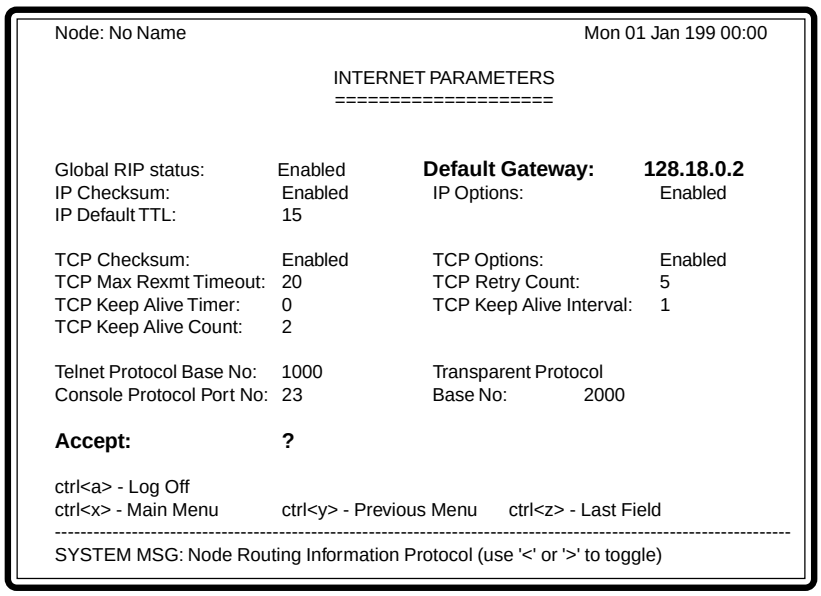
NB *Factory default settings*



To manually configure the unit for the example above, follow through the configuration menus detailed on the following pages.

Note that the **highlighted fields** *on each screen require you to enter a value detailed by the corresponding 'tick box' situated below each screen.*

LOGON
└ MAIN MENU
└ CONFIGURATION
└ INTERNET PROTOCOL CONFIGURATION
└ SYSTEM INTERNET PARAMETERS



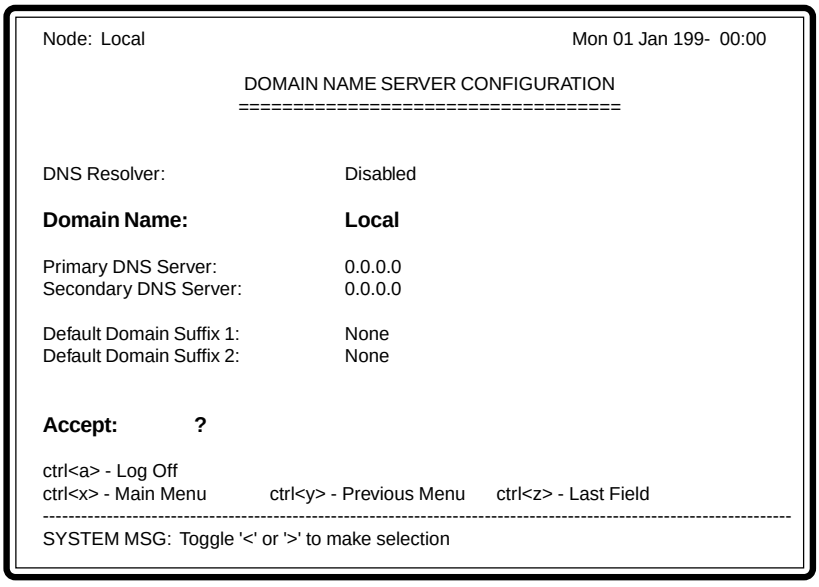
To move the cursor up and down, use the cursor arrow keys on your keyboard

The following parameter must be defined:

☑ **Default Gateway**
This address overrides any learned default but it is not advertised over RIP. Set for 128.18.0.2

Enter '**Y**' to '**Accept:**' to save displayed values.

LOGON
└ MAIN MENU
└ CONFIGURATION
└ INTERNET PROTOCOL CONFIGURATION
└ DOMAIN NAME SERVER CONFIGURATION

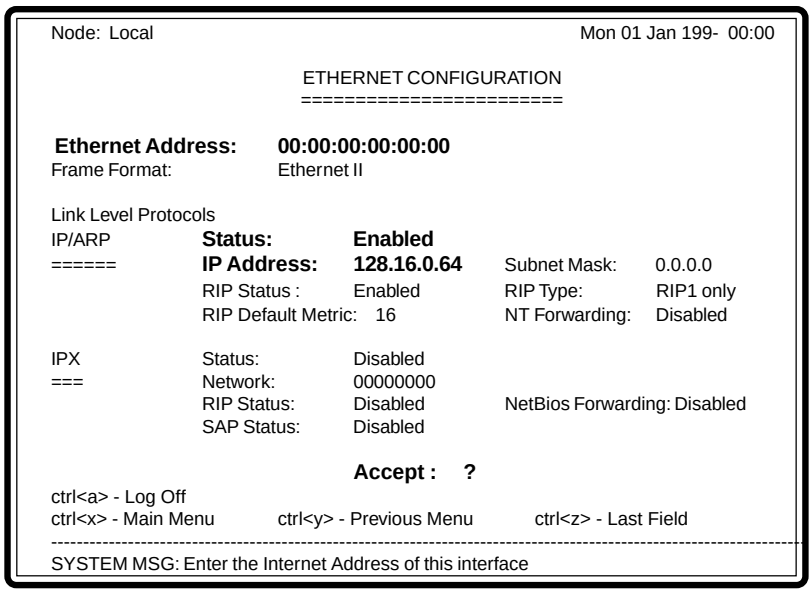


The following parameter must be defined:

☑ **Domain Name**
Enter the Domain Name for the unit - up to 255 characters. Use ctrl<d> to delete any characters after the cursor.

Enter '**Y**' to '**Accept:**' to save displayed values.

LOGON
└ MAIN MENU
└ CONFIGURATION
└ NETWORK INTERFACE CONFIGURATION
└ ETHERNET INTERFACE PARAMETERS



The following parameters must be defined:

Link Level Protocols
IP/ARP

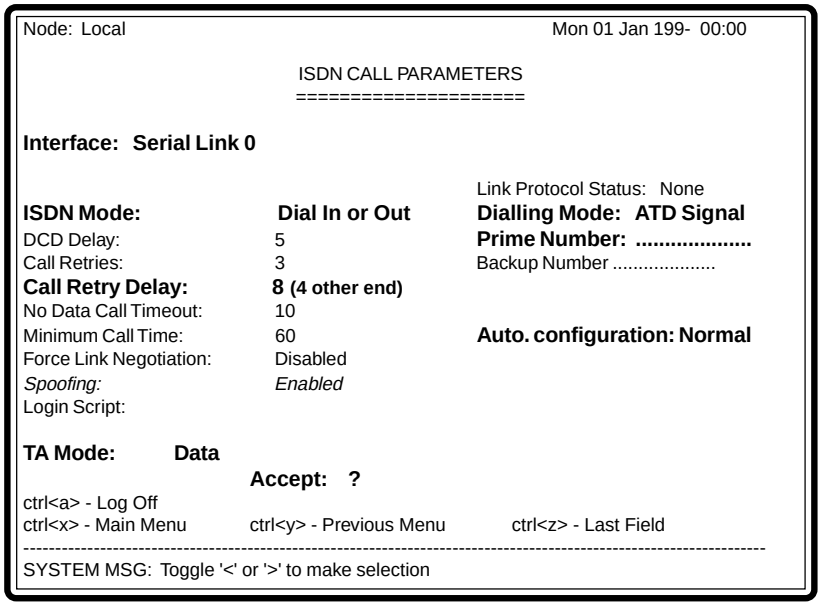
☑ **Status**
Use to enable support for IP/ARP protocols on the LINKSTREAM. Set to Enabled.

☑ **IP Address**
Enter IP address of the unit. Set to 128.16.0.64 (local end).

Enter '**Y**' to '**Accept:**' to save displayed values.

After setting the above, LINKSTREAM will need rebooting. This can be achieved by either pressing the RSET button or via the system reset screen.

LOGON
└ MAIN MENU
└ CONFIGURATION
└ NETWORK INTERFACE CONFIGURATION
└ ISDN PARAMETERS



These parameters only need configuring if an ISDN interface is required.

Note that the selected interface should be disabled to set up ISDN parameters. If the interface has not been previously used, it must first be enabled then disabled before ISDN call parameters can be set. This is to enable a valid clock for the interface.

☑ **Interface**
Select serial link 0.

☑ **ISDN Mode**
Dial In Only = Will only accept external calls.
Dial Out Only = Will only make calls from the unit.
Dial In & Out = Will both make and accept calls.

☑ **Call Retry Delay**
The call retry delay is the time taken for a retry after a failed attempt to connect. Both ends of the link must be set differently.

☑ **Prime Number**
This is the ISDN number to be called by the LINKSTREAM.

☑ **TA Mode**
Note: Enter TA Mode to check that the TA responds prior to using Auto Configuration Mode.
Type AT<CR>. TA should return 'OK'.

☑ **Auto Configuration Mode - Link 0**
This mode automatically configures the TA.
Select NORMAL. Enables Link 0 to answer.

☑ **Auto Configuration Mode - Link 1**
Select serial link 1, select Auto Configuration Mode.
Select OFF to disable Link 1 from answering.

Enter '**Y**' to '**Accept:**' to save displayed values.

LOGON
MAIN MENU
CONFIGURATION
NETWORK INTERFACE CONFIGURATION
PPP LCP PARAMETERS

```
Node: Local                                          Mon 01 Jan 199-  00:00

                    PPP INTERFACE - LCP/PAP PARAMETERS
                    ==================================

Interface:                          Serial Link 0
Status:                             Enabled

LCP
        Echo Interval:    0         Echo Fails:          5
        MRU Size:         1500      ACCM:                N/A
        Security:         None      Link Compression:    Disabled
                                    Multilink:           Disabled

PAP
        Remote Username:
        Remote Password:

                                    Accept:        ?

ctrl<a> - Log Off       ctrl<b> - IPXCP Config      ctrl <f> - IPCP Config
ctrl<x> - Main Menu     ctrl<y> - Previous Menu     ctrl<z> - Last Field
-------------------------------------------------------------------------------
SYSTEM MSG:  Select network interface ('<' or '>' to toggle)
```

The following parameters must be defined

☑ **Interface**
Select the appropriate serial link (0-1). Set for 0.

☑ **Status**
Set for Enabled.

☑ **MRU Size**
Change only if voice is being used.
Set to 240 (voice and data).
Set to 1500 (data only).

Enter '**Y**' to '**Accept:**' to save displayed values.

LOGON
MAIN MENU
CONFIGURATION
NETWORK INTERFACE CONFIGURATION
PPP IPCP PARAMETERS

```
Node: Local                                          Mon 01 Jan 199-  00:00

                    PPP INTERFACE - IPCP PARAMETERS
                    ==================================

Interface:                  Serial Link 0
Status:                     Enabled

Local IP Address:           128.18.0.1      Subnet Mask:      255.255.0.0
Remote IP Address:          0.0.0.0         NT Forwarding:    Disabled

Header Compression:         None

RIP Status:                 Disabled        RIP Type:         RIP1 only
Default Gateway Metric:     16              RIP Metric:       1
Default Route:              Disabled

                            Accept:        ?

ctrl<a> - Log Off       ctrl<b> - LCP Config        ctrl <f> - IPXCP Config
ctrl<x> - Main Menu     ctrl<y> - Previous Menu     ctrl<z> - Last Field
-------------------------------------------------------------------------------
SYSTEM MSG:  Select network interface ('<' or '>' to toggle)
```

The following parameters must be defined

☑ **Status**
Set to Enabled.

☑ **Local IP Address**
Enter IP address of the selected interface.
Set to 128.18.0.1

Enter '**Y**' to '**Accept:**' to save displayed values.

LOGON
|
MAIN MENU
└ CONFIGURATION
|
CHANNEL CONFIGURATION
|
CHANNEL SESSION PARAMETERS

```
Node:  Local                                                    Mon 01 Jan 199-  00:00

                         CONFIGURE SESSION PARAMETERS
                         ============================

Channel No:          0                                  Telnet        Transparent

Internet Address:    0.0.0.0     Protocol Port Numbers:  1000          2000

Access:              Remote      Session Mode:           Transparent   Default Port: 23

Maximum Sessions:    4           Idle Timeout:     0     TCP Window Size:     1024

Autocall Destination:  None
Preferred Destination:  None

Data Transfer Node Parameters:
                 Terminal Type:        unknown
                 Session Echo Node:    Telnet Remote

                                                  Accept:          ?
ctrl<a> -Log off
ctrl<x> - Main Menu          ctrl<y> - Previous Menu          ctrl<z> - Last Field
-------------------------------------------------------------------------------------------
SYSTEM MSG:  Enter chan no. ( 0 to [max no. chans - 1] )
```

The following parameters must be defined

Each channel (0-23) to be configured as follows:

☑ **Channel Number**
Select channel number.

☑ **Access**
Select to Remote at local and set to Dedicated at the remote end.

☑ **Session Mode**
Select Transparent at both local and remote.

☑ **Autocall Destination**
Enter a destination IP address. Set as 128.16.0.64 remote only.

Enter **'Y'** to **'Accept:'** to save displayed values.

LOGON
|
MAIN MENU
└ CONFIGURATION
└ SYSTEM RESET

```
Node: Local                                                    Mon 01 Jan 199-  00:00

                                  SYSTEM RESET
                                  ============

Warm Start Node:          .                  Confirm:          .



ctrl<a> - Log Off          ctrl<x> - Main Menu          ctrl<y> - Previous Menu
-------------------------------------------------------------------------------------------
SYSTEM MSG:
```

You have now successfully set up your local LINKSTREAM. Before configuring the remote unit, perform a system reset. This screen is entered to reboot the system and requires a confirmation response.

APPROVALS

The LINKSTREAM meets the following European standards:

BABT Approval No.	NS/2220/1/P/603943
Safety	EN 60950
Network safety	EN 41003
Network connection	NET1 clause 8 and Annex A9 (X.21 variant only)
ISDN	Euro-ISDN to I-CTR3

The LINKSTREAM carries the 'CE' mark.

WARNING For continued user safety protection, and for protection of the Telecommunications Network, this equipment must be connected to a protective earth.

WARNING For continued protection of the Telecommunications Network only SELV circuits should be connected to any user port.
Note: User channels are labelled 0 to 23 on the stand alone unit.

SAFETY NOTICE

CAUTION

The LINKSTREAM has a component containing a lithium battery, on the base card. There is a danger of explosion if this is incorrectly replaced. Replace only with the same type. Dispose of used batteries properly and do NOT cut open or expose to a naked flame or to temperatures outside the range of -20 to +60 degrees C.

GENERAL

Dimensions	285 x 260 x 88 mm. (LINKSTREAM).
Weight	Up to 1.6 kg. Depending on options.
Environment	0° to 40°C operating, -20° to 40°C storage, 0 - 95% RH non-condensing.
Processor	16 bit Microcontroller running at 33MHz.
Memory	2Mbyte Flash, 4Mbyte SRAM.
Protocols	TCP/IP/IPX & Telnet over LAN/WAN interfaces.
Network buffer size	82 - 1514 bytes.

POWER SUPPLY

Type	Internal.
Power consumption	40W.
Power input	110V to 240V AC-5% + 10% 50 - 60Hz.
Power output	+5V DC, +12V DC, -12V DC regulated to 1.5%. Overload and short circuit protection.

ETHERNET INTERFACE

10Base5	15-way D socket (stand alone and rack mount).
10Base2	BNC socket (stand alone).
10BaseT	RJ45 socket (stand alone).

TRUNK INTERFACES

Two trunk interfaces are provided, each with the following features:

Speeds	2.4K - 1Mbps.
Mode	Synchronous.
Clock source	Internal and External.
Protocol	PPP.
Data Compression	VJ, Lempel-Ziv, STAC, CSLIP, NCP.
Diagnostics	Local and Remote loopbacks.
Interface type	V.24, V.35, X.21 (V.11) selected by use of appropriate module.
Connector	15-way D socket.
ISDN	Basic rate (2B+D) ISDN connection providing the S-Bus interface onto the ISDN/2E network, presented as an 8-way RJ45 socket. Provides 2 x 64Kbps synchronous channels for connection to the trunk interfaces of the LINKSTREAM.

CONSOLE PORT

Speeds	50bps - 57.6Kbps.
Mode	Asynchronous.
User channel buffer	82 - 1514 bytes.
Parity	None, Odd, Even, Force Odd, Force Even.
Stop bits	1, 1.5, 2 bits.
Data bits	5 - 8 bits.
Flow control	XON/XOFF, DTR/RTS, IXON/XOFF.
Interface type	V.24/V.28.
Connector	RJ45 socket.
Protocols	SLIP/CSLIP/PPP/TRANSPARENT.