



B-Link

basic rate ISDN network simulator

Issue 4

Packet Data Systems Ltd

Rowan House, Unit 5 Beechwood Court, Long Toll, Woodcote, Reading, Berkshire, RG8 0RR, United Kingdom.

Tel: +44 (0) 1491 684013 **Fax:** +44 (0) 1491 684180 **E-mail:** sales@pds-test.co.uk **Web:** www.pds-test.co.uk

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Getting Started

Overview

The B-Link is a powerful, compact network simulator designed to assist with evaluation, training, demonstration and development of ISDN terminal equipment.

For exhibition or training purposes, calls can be in progress reliably for long periods between terminals. ISDN uses a complex message based protocol, which requires a pre-defined sequence of messages to be exchanged between the network and each terminal. The B-Link accurately emulates this protocol for reliable operation.

A user friendly Windows software package is provided for simple configuration. Parameters such as telephone numbers or operating modes can easily be saved to flash memory. Once configured as required, the B-Link is ready to operate at any time without the presence of a PC host.

<u>Models Available</u>	<u>Number of S/T Interfaces</u>	<u>No of U Interfaces</u>	<u>Total No of Interfaces</u>
B-Link2	2	0	2
B-LinkU*	2	2	2
B-Link3	3	0	3
B-Link4	4	0	4

*The B-LinkU has just two ports both of which are available as S/T or U interfaces. The user must connect one terminal to each port using the appropriate interface.

All features described within this user guide are common to each model unless indicated.

Packing List

- B-Link
- Power Adapter
- Serial Lead
- Software on CD ROM (includes user guide in PDF format)

System Requirements

- IBM Compatible PC with at least one Serial Port
- Windows 95/98/NT4/2000/XP
- CD ROM Drive

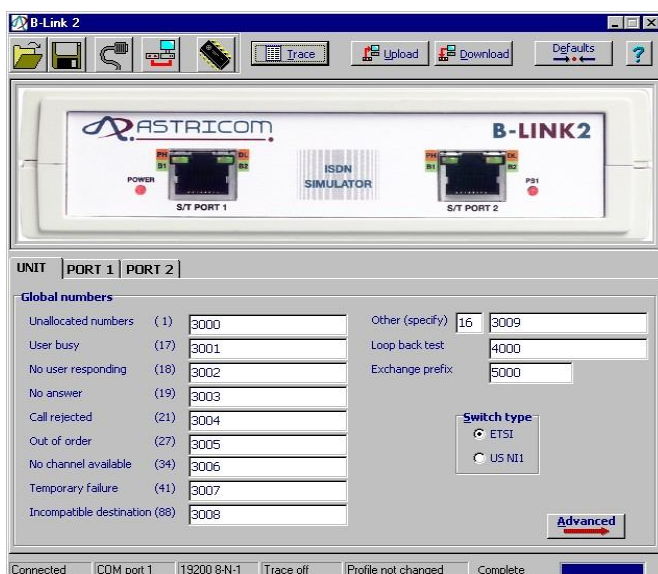
Software Installation

- Connect the B-Link to the PC Serial Port using the serial lead supplied.
- Plug in the power adapter to switch on the B-Link.
- Insert the CD ROM labelled **B-Link configuration software** into the CD ROM Drive.
- From Windows click **START** and then **RUN**.
- Open the file **D:\Setup.exe**. Follow on-screen instructions.
- When Setup is complete the program can be launched by clicking **START, PROGRAMS, ASTRICOM / B-Link**.

Running the B-Link Software

Having installed the software supplied, connect the B-Link to COM1 on your PC host using the Serial Lead supplied. Plug in the power adapter to switch on the B-Link. Click on the Windows **Start** Icon, select **Programs, ASTRICOM / B-Link**.

The main B-Link software window will open together with a small pop up window confirming that it is Searching for Unit. If a unit is not found this will be reported in the pop up window. If the B-Link is not found, check that the unit is powered and connected, then search again using the **Connect** icon.



Once a B-Link is found it's front panel image will appear in the main B-Link window and the pop up window will confirm the upload from the B-Link. Click **OK** to access the software which opens in the **Unit** tab showing settings common to all ports. To access settings and advanced features unique to a port click on the appropriate **Port** tab.

Important Note

Please remember to download any changes you wish to make to the configuration before using the B-Link. This ensures correct operation and is achieved by clicking on the **Download** icon.

Download and Upload Functions

Download to Pod

Having entered the required configuration it is **important** to click the **Download** icon to fix this configuration. Once the configuration has been successfully downloaded to the B-Link, the unit may be disconnected from the PC host and used completely independently.

Upload from Pod

This function automatically takes place when the B-Link software program is launched and reads the saved configuration of any connected B-Link. This may also be requested at any other time by clicking on the **Upload** icon.

Saving Profiles

You may save a range of different configuration profiles in any chosen host directory by clicking on the **Disk** icon. These saved configurations may be recalled by clicking on the **Open Profile** icon, select the required file and then download this to the B-Link to allow a speedy return to a known set up.

Restoring the Default Configuration

The B-Link default configuration may be selected at any time by clicking on the **Defaults** icon. Once restored, the default configuration may be fixed in to the pod by clicking on the **Download** icon.

Upgrading the Firmware

Connect the B-Link to the host PC using the serial lead supplied. From the main B-Link window select **Upgrade** and then **Pod Firmware**. A window will appear to warn you that old firmware will be erased before new firmware can be loaded. Click **OK** to continue.

A Pod Firmware Upgrade window will open showing the action and status throughout the upgrade. After the pod has been checked and the memory has been erased a window will open allowing you to define a path and file name for your upgrade file. When the correct .pfu file has been selected click **Open**. You will return to the Pod Firmware Upgrade window and the progress of the new firmware download will be displayed.

When completed, a window will open asking you to power cycle the pod and then click **OK**.



ISDN Basic Rate S-T and U Reference Points

Whether you are based in North America or in Europe the final link between your network operator and your home or company for basic rate ISDN is a pair of copper twisted wires. This is known as the U reference point and is based on a 2B1Q line code. A network termination device (NT1) is necessary to convert between the 2B1Q two wire interface and the standard S-T four wire interface required by most ISDN basic rate terminals.

In North America it was determined legally that sourcing a suitable NT1 would be the responsibility of the customer but in Europe, the service providers install their own preferred NT1 at the customer site and the customer is only allowed access to the S-T user interface. It is for this reason that B-Link ISDN network simulators were developed with a choice of S-T or S-T and U interfaces.

Which interface type should you use?

If you are based in North America and expect to connect your own NT1 or a terminal fitted with a built-in NT1 then you will need to use the U interfaces provided on our B-LinkU. Alternatively, if you have terminals with an S-T interface then you can disregard the NT1 and connect these terminals directly to the ISDN S-T interfaces provided on any of our B-Link units.

This choice of connection is available for your convenience but please note that incompatible interface types will not work together and damage may occur if you connect incorrectly. Please do not hesitate to contact PDS if you have any questions.

LED Indicators

B Channel Indicators

When a call is in progress the B channel or channels being used are indicated by a green LED indicator. If calls are in progress on both bearer channels, both LED indicators at the top of the appropriate RJ45 socket will illuminate green. Each port is labelled to show the position and colour of each LED indicator.

B1 Channel Indicator

If B1 has a call in progress the top left hand LED on the appropriate port will change from orange (see PH Indicator) to green.

B2 Channel Indicator

If B2 has a call in progress the top right hand LED on the appropriate port will change from orange (see DL Indicator) to green.

Physical Layer

S/T Interfaces (B-Link2, 3, 4 and U)

An orange PH indicator is provided in the top left hand corner of each S/T RJ45 socket. When a terminal is plugged into any port and gains synchronisation with the network clock provided by the B-Link, this LED will illuminate.

U Interface (B-LinkU only)

An orange SYN indicator is provided in the top left hand corner of each U RJ45 socket. This indicator will flash while the terminal connected to the U interface attempts to synchronise with the network clock provided by the B-LinkU. After synchronisation is achieved the LED will illuminate orange continuously.

DL Indicator

The DL (Datalink) indicator is located in the top right hand corner of each RJ45 socket and will illuminate orange when Layer 2 is established between a terminal and the port to which it is connected.

PS1 Indicator

This LED confirms the presence of phantom power (PS1) which is fixed in normal mode on each of the S/T (not U) interfaces. This is fixed in normal mode on all B-Link units to supply any terminals requiring power which are connected to the S/T interfaces.



Unit Tab

Global Numbers

The **Unit** tab is the default window and displays **Global Numbers** that are common to the ISDN ports. When these telephone numbers are dialled this results in the B-Link returning different call clearing causes to the calling terminal for test purposes.

The feature allows a user to connect an ISDN terminal to one of the B-Link network ports and dial one of the pre-defined numbers. If 3000 is dialled on the terminal, the B-Link will respond to the incoming SETUP Message and then disconnect using 'Unallocated Number' clearing cause of '1'. Similarly, if 3001 is dialled the call will be disconnected with a 'User Busy' clearing cause value of '17'.

The most frequently tested Clearing Cause Values have been given default numbers to simplify operation and the user can easily alter these numbers to any number of up to 20 digits.

If a Cause Value is required that is not in the Global numbers panel, it is possible to enter any cause value of between 1 and 3 digits in the **Other Cause** panel (default is 16). This value is returned when 3009 is dialled on the terminal but again this may be altered to any number of up to 20 digits.

Loopback Mode – Testing one Terminal in Isolation

If the number 4000 is dialled, the B-Link will automatically answer this call as if it were routed and then loop back any data sent from the terminal. This allows one terminal to be tested in isolation.

Exchange Prefix

The exchange prefix (default 5000) is a number which may be dialled before the port number you wish to reach (similar to an area code) to allow testing of longer numbers. Each port number may be 20 digits long and the prefix may be 10 digits long which allows a maximum of 30 dialled digits.

Unit - Advanced Features

Select the **Unit** tab and then click on the **Advanced** icon to enter the unit advanced features menu.

TEI Option

By default the B-Link will expect a terminal to remember its terminal end point identifier (TEI) value when it is disconnected and re-connected to one of the B-Link ports. If the terminal used forgets its TEI when disconnected it is better to tick the box labelled **Remove TEI on PH Deactivation**.

Nailed Up Channels

Some ISDN service providers offer a combined ISDN and leased line service where one bearer (B) channel is available on demand while the other B channel is left permanently connected. The B-Link allows you to fix a permanent connection between B1 on port 1 and B1 on port 2 or between B2 on port 1 and B2 on port 2 to simulate this leased line provision.

Timers

By default, the B-Link does not drop layer 2 and layer 1 automatically at the end of a call but in some European networks very short timer values are used to carry out this function. If you wish to test a terminal's response to a very quick deactivation or to simulate a particular network provision this can be achieved by editing the values found after clicking on the **Timers** icon.

Since ISDN is a message based protocol there is a finite time required to respond to messages at each Layer and if the Layer is dropped by the network it is possible for the connected terminal to hang in an unknown state. The B-Link enables the testing of terminal behaviour in these situations

DL Idle Release Delay

The DL Idle Release Delay timer is switched off by default. This is the time taken by the B-Link to drop Layer 2 if no calls are forthcoming. When a terminal is physically connected to a network port the protocol starts a sequence of Layer 2 messages to check and allocate Terminal End Point Identifier (TEI) values. Once the TEI is allocated the network and the terminal exchange Receiver Ready 'RR' messages to confirm that they are ready to communicate. Some European networks will drop Layer 2 to recover TEI values if no calls exist after a pre-defined time in order to remain efficient. The DL Idle Release Delay Timer is started as soon as the terminal receives a TEI and this timer value can be altered by the user in the range of 1 to 999 seconds. 0 switches the timer off (default).

PH Idle Deactivation Delay

Before Layer 2 can start, the ISDN terminal must go through an information state exchange with the network to ensure that accurate timing and synchronisation exists. This is a Layer 1 (Physical Layer) activity and some networks will deactivate at Layer 1 if Layer 3 and Layer 2 are inactive. The PH Idle Deactivation Delay timer on the B-Link starts as soon as synchronisation is achieved with a terminal. After the user sets PH Idle Deactivation Delay the network will deactivate until a call is sent to or from the terminal. The user may enter any value in the range of 1 to 999 seconds and the default value is 0 (off).

DL Release After Call Delay

ISDN call control exists at Layer 3 and at the end of a call, some networks will drop layer 2 after a pre-determined time which may be as little as 50ms. This can cause problems with a terminal so the B-Link allows the user to enter any value between 50ms and 499s (0.5 x 9999) for this timer which starts as soon as a call (Layer 3) is disconnected. The default value is 0 (off).

DL Release to PH Deactivation Delay

When Layer 2 is dropped, a timer is started in the B-Link. When this timer expires the Physical Layer (Layer 1) is automatically deactivated and will not reactivate until a call is sent to or from the terminal. This timer allows true ISDN European network simulation and may be altered to any value between 100ms and 999S. The default value is 0 (off).

Port Tab's

Numbering Modes

Click on the **Port 1** tab to see that the default numbering mode is Single Number where the same telephone number is dialled to access both bearer channels. B1 will be allocated first if available and then B2. Single Number is the numbering mode used in all ETSI compliant countries but does not allow direct dialling to a particular terminal connected on the S bus. MSN is the ISDN basic rate equivalent of DDI (Direct Dialing-In), which is used for this purpose.

Default Telephone Numbers

<u>Port Number</u>	<u>B1</u>	<u>B2</u>
BRI 1	1111	1111
BRI 2	2222	2222
BRI 3 (B-Link3 & B-Link4 only)	3333	3333
BRI 4 (B-Link4 only)	4444	4444

Single Number Mode (Default)

In this mode, the same number is dialled to access both bearer (B) channels. Dial this number once to connect only using B1 (if available) and then a second time to connect on B2.

Dual Fixed

In dual fixed mode, the number allocated to B1 will only connect using B1 if this channel is available and the number allocated to B2 will only connect using B2 if this channel is available. If the called channels are not available then the call will be rejected. This mode is exclusive to some European countries.

Dual Floating

In dual floating mode, the first number allocated will connect using B1 if B1 is available and if not will connect using B2. Likewise, the second allocated number will connect using B2 if B2 is available and if not will connect using B1.

MSN

This mode allows a unique number to be programmed in to all terminals plugged into the same S bus. Only the terminal with an MSN matching the MSN included in the incoming SETUP message will accept the call. If any connected terminal is not programmed with an MSN it will respond to all incoming calls. The B-Link achieves MSN by allowing the last digit sent between ports to be in the range of 0 to 9 for example, instead of dialling 1111 (default) when calling from port 2 to port 1 you may dial 1110, 1111, 1112...etc and each receiving terminal should be programmed to respond to an MSN digit of 0 or 1 or 2....etc.

SPID Operation

SPID values are used exclusively in the United States to allow terminals capable of supporting different call types or services to be identified when they are connected to the network. Using this method, if a terminal is only capable of supporting voice calls (not video or data) then it can be charged accordingly, perhaps at a lower rate.

In order to successfully set-up the connected ISDN user equipment, it is vital to understand the use of Directory numbers and their associated SPIDs.

The Directory number is the number that must be dialed in order for the calling party to reach the chosen ISDN port. Different numbering modes exist (see page 10 for details):

- Single – a single Directory Number covers both available B channels.
- Dual fixed – each B channel has a separate Directory Number.
- Dual floating – two Directory Numbers exist – either number can be used to access either or both B channels.

Note: MSN is not available in NI1 mode.

To use a SPID with the B-Link, you must first click on the unit tab and change the switch type to US NI1. When each port tab is then selected, the default SPID values will be highlighted and may be edited as required.

In Single number mode, a single SPID can be entered. This SPID must be programmed into the user terminal equipment exactly as it is displayed in the SPID field of the B-Link port configuration Window.

In Dual number modes, two SPIDS can be entered. If the user terminal equipment supports two B channel operation then, using either of the Dual channel modes, you can program two different SPIDs into the user terminal equipment. The two SPIDs programmed must again match exactly, the SPID numbers as displayed in the B-Link port configuration software.

When the B-Link receives SPID values from the connected terminal, they will be checked against the numbers entered under the port tab. If they match, the B-Link will send a corresponding Layer 3 TID (terminal identifier) value, in a cyclic range from 0 to 63, which must be recorded and used by the terminal. If the SPID value received by the B-Link does not match the numbers entered in the software, the call will be ignored.

Note!

A single number can still be used for both channels by programming one SPID value into the user equipment twice.

Note!

Although the Directory numbers and associated SPIDs are similar, they can be programmed with completely different values because they are used for two different purposes. The Directory number is used to check incoming calls but the SPID is used to negotiate the service profile with the local network. They are similar in value, by default, to make it easier to guess or remember the SPID value.

Note!

By default, the router plugged in to port 1 needs to be configured with a SPID of 11110101 but needs a dial string of 2222 because it will be calling port 2. The SPID is common to the network port and the connected router but the dial string is not because you will usually be calling another router on another port.

Service Profile

Although the B-Link supports several SPID values, it only supports one service profile, which will allow any terminal to use any service for maximum convenience. The B-Link does not support the sending of US ID (User Service ID) which is broadcast by the US networks to ensure that connected terminals will only respond to calls matching their required service profile.

Port Advanced Features

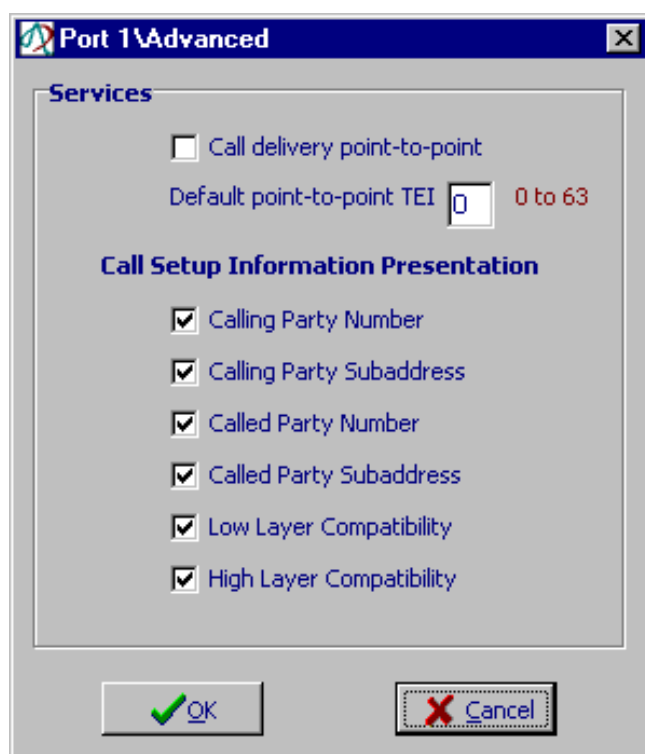
Select a port by clicking on the appropriate port tab and then click the **Advanced** icon to enter the port advanced features menu.

Services

The default B-Link operation is point to multipoint but the advanced menu allows point to point selection and the user allocation of any point to point TEI value in the range of 0 to 63.

Call Setup Information Presentation

By default, the B-Link will include the most common information elements in the setup message sent to the called terminal. If you wish to de-select presentation of these information elements this can be configured independently on each port.

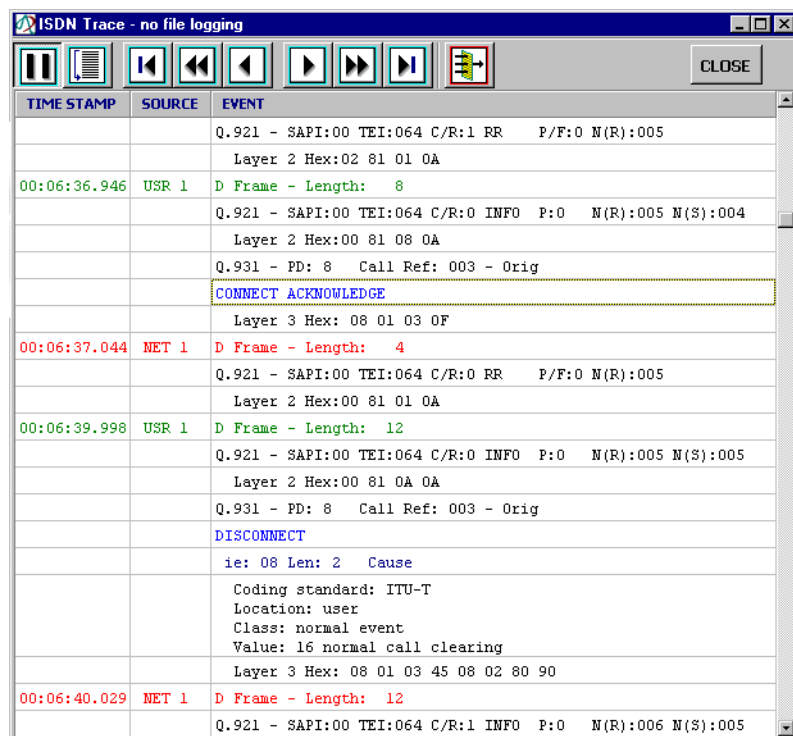


Supplementary Services often incur additional charges from the network operator and are used to carry additional information between the terminals. For example, MSN is one method of accessing a particular terminal connected with others on an S bus but another method is to use a Subaddress. The Subaddress is a string of numbers and letters (IE5 characters) which may be programmed in to a called or calling terminal. This information is carried in the ISDN setup message and is not part of the ISDN number used by the network for routing the call. Each terminal connected to the passive bus needs to be allocated a unique sub-address which is pre-programmed into it's call handling process. Only the terminal programmed with a matching Subaddress will respond to the incoming call.

Trace Function

The B-Link trace feature is easy to use and offers comprehensive filters which may be configured by the user. A captured trace file may be viewed in real time or both viewed and recorded to a text file simultaneously.

When the trace window is open, a range of icons are displayed along the top of the window:



Click on this icon to pause the display if you wish to search back through the trace file.



Click on this icon to return to the auto scrolling live display.



Having paused the trace, this icon will take you to the first event.



This icon scrolls back through the trace half a page at a time.



This icon scrolls back one line at a time.



This icon scrolls forward one line at a time.



This icon scrolls forward through the trace half a page at a



time. Click this icon to return to the last recorded event.



This icon allows filtering by port or message as detailed overleaf.

Filter Options

Ports

The default tab is **Ports** which enables the display of messages from port 1, port 2 or all ports.

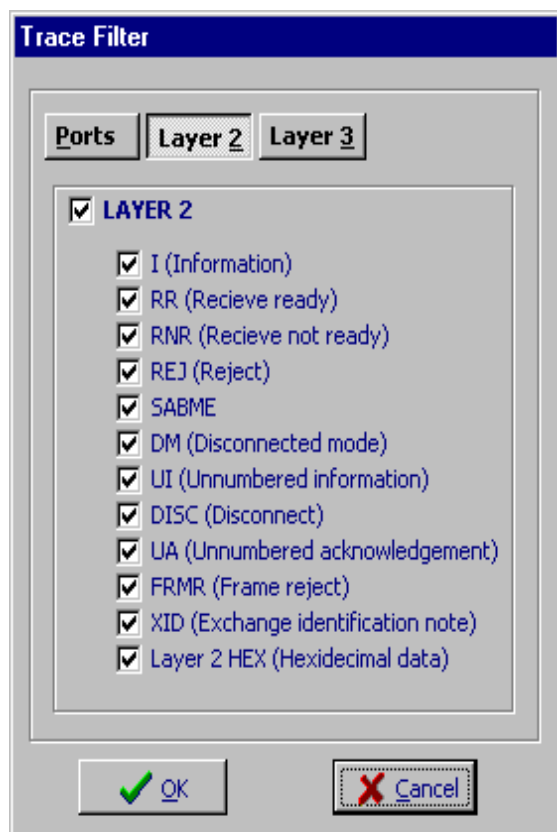
Layer 2

This tab enables the selection of any, all or no layer 2 messages to be viewed. Before the trace is decoded by the B-Link it is present in HEX and you can tick to select whether or not to view the HEX content. It can be useful to view the HEX when sending proprietary messages between terminals which are not part of the ETSI decode available on the B-Link.

Layer 3

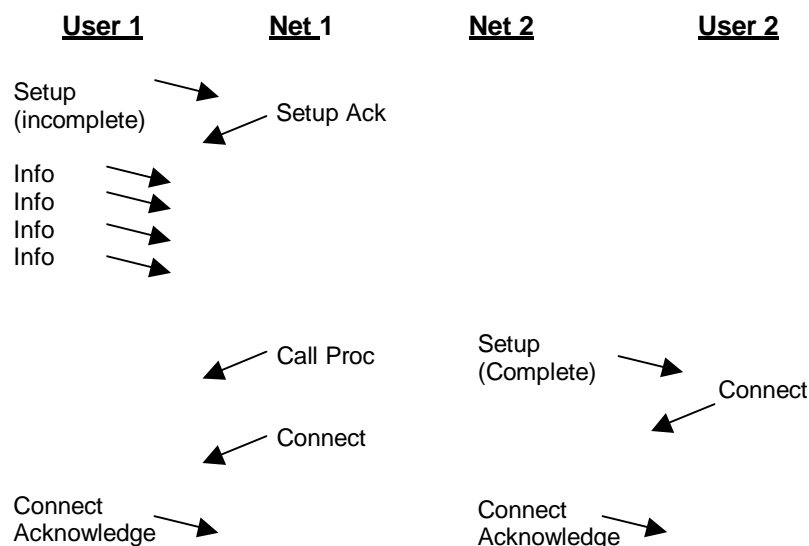
This layer 3 tab allows the selection of any, all or no layer 3 messages to be viewed. The layer 3 message content may also be viewed in HEX if required.

When you have altered any parameter in any of the tabs detailed above click OK to invoke the filter or just cancel.



Protocol Trace Example

User 1 calling User 2 through the simulated ISDN network



User 1 goes off hook which causes a SETUP message to be sent to Network port 1. This SETUP is incomplete since it does not contain any dialled digits so the network simply responds with a SETUP ACKNOWLEDGE message.

User 1 now dials four digits using his keypad and each of these are sent as separate INFO messages to Network port 1. As soon as the fourth INFO message is received the network knows it has enough information to route the call so a SETUP message is sent from Network Port 2 to User 2.

This second SETUP message is sent by the network and is complete containing all the dialled digits as a Called Party Number Information Element (user selectable message). Network 1 sends a CALL PROCEEDING message to User 1 to confirm progress.

Shortly after, User 2 sends a CONNECT message to Network 2 which responds with a CONNECT ACKNOWLEDGE message and Network 1 then sends a CONNECT message to the Calling Party, User 1.

User 1 responds with a CONNECT ACKNOWLEDGE and call connection has now been successfully established.

This example is useful because it contains an overlap dialled call where each digit is dialled individually by a terminal and then an en-bloc call where all digits are contained in one SETUP message sent by the network. ISDN is a simple and effective protocol which can be fully investigated using this powerful B-Link trace feature.

Technical Specification

Ports

ISDN S0 Interface (All B-Links)

Connection:	1 x RJ45 per port
Interface Type:	S/T Interface
Physical Layer:	I.430 'S' bus. NT Mode
Layer 2:	Q.921. Euro-ISDN/NI 1
TEI's:	2 off
Layer 3:	Q.931. Euro-ISDN/NI 1
PS1 Feeding:	Normal
Pinout 5:	Tx 1
Pinout 4:	Tx 2
Pinout 3:	Rx 1
Pinout 6:	Rx 2

ISDN U Interface (B-LinkU Only)

Connection:	1 x RJ45 per port
Interface Type:	U Interface
Physical Layer:	2B1Q 'U' bus. NT mode
Layer 2:	Q.921 Euro-ISDN/NI 1
TEI's:	2 off
Layer 3:	Q.931 Euro-ISDN/NI 1
Power Feed:	No power is provided on the U interface
Pinout 4:	Tip
Pinout 5:	Ring

Serial Port

Connection:	9 way 'D' type Female
Physical Layer:	RS-232
Speed:	19200
Bits:	8
Parity:	None
Stop Bits:	1
Flow Control:	XON XOFF
Pinout 2:	Tx output
Pinout 3:	Rx input
Pinout 5:	Signal Ground:

CE Marking

Compliance with EMC and Low Voltage Directives.

FCC Compliance

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. The device must be used with the supplied power adapter, to ensure compliance with part 15 of the FCC rules.

Serial Port Selection

The B-Link will default to Com 1 but you can select another port by clicking on the **Select serial port** icon to use another port if required.

Power Supply Unit

Connection:	Models available for UK, Europe, Australia and United States as required.
Type:	2.1 mini barrel connector, centre positive.
Voltage:	5v DC Regulated

Environmental

Operating Temp:	0 to 40°C
Storage Temp:	-20 to +50°C
Relative Humidity:	90% non-condensing
Size:	15.3cm x 10.3cm x 4cm (6.1" x 4.1" x 1.6")
Weight:	300g (10oz)
PSU size:	35mm x 70mm x 50mm (plus required plug).
PSU Weight:	125g



Warranty

One-Year Limited Warranty

Packet Data Systems Ltd warrants its hardware products against defects in materials and workmanship for a period of one year from the date of receipt. During the warranty period Packet Data Systems will, at its own discretion, either repair or replace products which prove to be defective.

Exclusions

The warranty of your equipment will not apply to defects or damage resulting from:

- Improper or inadequate maintenance by the customer.
- Unauthorised modification or misuse – All warranty seals must remain intact.
- Operation outside of the environmental specifications of the product.
- Improper site preparation and maintenance.

Warranty Limitations

The warranty set forth above is exclusive, and no other warranty, whether written or oral, is expressed or implied.

Service During the Warranty Period

If your hardware should fail during the warranty period contact Packet Data Systems for a return authorisation.

When sending equipment back to Packet Data Systems, follow the repacking guidelines below.

CAUTION...Shipping damage as a result of inadequate packaging is the customer's responsibility and *will not* be covered under the above warranty.

Service After The Warranty Period

If your hardware fails after the warranty period, the equipment should be returned to Packet Data Systems, after first having obtained a return authorisation from Packet Data Systems. The equipment will be assessed and a quotation issued for its repair. When sending equipment back to Packet Data Systems, follow the repacking guidelines below. Non-warranty repairs *will not* be undertaken by Packet Data Systems until an official purchase order is received from the customer.

Repacking Guidelines

- Use the original shipping container and packaging materials if possible.
- Return all original accessories. Any missing items will be charged for.

Warnings

Lethal Voltages - are present within the power supply adapter which is supplied with each B-Link. There are no user serviceable parts in the unit. On failure, return to the supplier.

Configuration - of the unit does not require access into the case. Entry into the case by removing screws should only be made by persons authorised by the supplier, otherwise Warranty could become void.

Power Supply - only the provided Power Supply Unit should be used with the B-Link, otherwise Warranty could become void. There are no replaceable fuses in the unit or power supply.

Disposal - The B-Link contains hazardous components that require safe disposal at the end of life. Disposal should be carried out by a competent person.

Glossary

Basic Rate ISDN

The Basic Rate ISDN interface provides a bandwidth of 144Kbit/s which is divided into two bearer channels of 64Kbit/s each and one data (D) channel for signalling with an available bandwidth of 16Kbit/s.

Bearer Channel

A 64Kbit/s time slot available to carry voice or data across the ISDN network. Two bearer channels are available on a basic rate interface (2B+D) and thirty bearer channels are available on a primary rate interface (30B+D).

Clearing Cause Values

A range of more than 50 reasons which can be given by the network or the terminal in Disconnect or Release messages to indicate why a call has ended or failed. A successful call will always end with a clearing cause of 016 (normal call clearing) but a failed call will clear with another cause such as 088 (incompatible destination). Cause values are very useful for fault diagnosis.

DDI

Direct Dial-In is the PSTN equivalent of MSN allowing a particular called party to be accessed with a unique number.

DL

Data Link Layer (Layer 2/Q.921 protocol).

ETSI (Euro-ISDN)

This is the latest Pan-European protocol specification which supersedes, and is generally compatible with, the earlier NET 3 specification for basic rate ISDN.

Global Settings

These are parameters such as timer values and telephone numbers which apply to all ports on the B-Link.

Global Timers

Timer values in seconds for dropping Layer 2 and Layer 1 before or after a call, which apply to all BRI ports on the B-Link.

Information Element

This is the name for data fields carried in an ISDN Layer 3 message.

ISDN

Integrated Services Digital Network.

MSN

Multiple Subscriber Number allows a range of up to ten numbers to be dialled to access one ISDN port. Each terminal may be programmed to accept calls from a particular number. An ISDN equivalent of DDI.

Passive Bus

This is an ISDN feature which allows up to 6 terminal devices and two voice devices to share the same twisted pair each with unique identification.

PH

Physical Layer for synchronisation and activation.

PS1

Power Source 1 or Phantom Power provided by the network to the ISDN S bus.

PSU

Power Supply Unit.

PSTN

Public Switched Telephone Network is the older analogue switched network

Receiver Ready

This is a handshake message at Layer 2, exchanged between the ISDN network and each terminal to confirm that both are ready to communicate.

RJ45

Standard eight way physical connector for basic rate and primary rate (E1) ISDN.

S/T Interface

The standard interface between ISDN terminals or terminal adapters and the ISDN basic rate network in Europe.

Setup Message

An ISDN Layer 3 message generated by, or to an ISDN terminal in order to establish a call.

SPID

Service Profile ID is used in the US protocols only to identify the type of terminal being used on an ISDN line, usually for the purpose of charging.

Subaddress

An ISDN to ISDN service to identify called and calling terminals used for direct dialing and call security.

Supplementary Service

These are optional services above the basic ability to make a call. Public Telephone Operators offer a range of Supplementary Services as cost options which can include: Calling Line Identification, Call Waiting, Call forwarding, Multiple Subscriber Number and Subaddressing.

Terminal Equipment

Telephones and other equipment such as video conferencing equipment and terminal adapters that the user will connect to the telephone line.

Time Slot

Term used to describe each 64Kbit/s channel available over ISDN.

U Interface

The standard customer interface in North America requiring connection to an NT1 or a terminal fitted with a built-in NT1.

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