TB1016
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# SIMLine

## Basic Rate ISDN Simulator/Monitor

## User Guide

ver 1.1

P/N STG0103

BLACK BOX CATALOGUE LTD

# Contents

# Packing List

**SIMLine ISDN S0 POD**

**Power supply adapter**

- **25 way ribbon cable**
- **This user guide**
- **Software disc**
- **Carrying case**

# Supplied configuration

**The standard SIMLine is delivered with the following configuration:**

| | | |
|---|---|---|
| NUMBERING OPTION (i.e. one number per B channel) | = | STD |
| CALLED NUMBER PRESENTATION | = | OFF |
| CALLED SUBADDRESS PRESENTATION | = | OFF |
| CALLING NUMBER PRESENTATION | = | OFF |
| CALLING SUBADDRESS PRESENTATION | = | OFF |
| HIGH LAYER COMPATIBILITY PRESENTATION | = | OFF |
| LOW LAYER COMPATIBILITY PRESENTATION | = | OFF |

**The following numbers are assigned to the ports and channels:**

| | | |
|---|---|---|
| INTERFACE 1 CHANNEL B1 | = | 1111 |
| INTERFACE 1 CHANNEL B2 (STD mode only) | = | 3333 |
| INTERFACE 2 CHANNEL B1 | = | 2222 |
| INTERFACE 2 CHANNEL B2 (STD mode only) | = | 4444 |

**The following numbers can be dialed to generate call failures with the returned Cause specified:**

| | | |
|---|---|---|
| UNALLOCATED NUMBER | = | 3000 |
| USER BUSY | = | 3001 |
| NO USER RESPONDING | = | 3002 |
| NO ANSWER | = | 3003 |
| CALL REJECTED | = | 3004 |
| OUT OF ORDER | = | 3005 |
| NO CHANNEL AVAILABLE | = | 3006 |
| TEMPORARY FAILURE | = | 3007 |
| INCOMPATIBLE DESTINATION | = | 3008 |
| OTHER CAUSE NUMBER | = | 3009 |
| LOOPBACK | = | 4000 |
| OTHER CAUSE | = | 081 |

Note: All the above options can be modified and fixed in the SIMLine POD Flash memory using the menu options within the SIMLine PC software outlined in this guide.

# Principles of Operation

Warning: The SIMLine POD is an ISDN Network Simulator suitable for connection to ISDN Terminal Equipment conforming to the ITU-T I.430 physical standard S interface. The Network interface ports must not be connected to any other type of equipment and especially not another ISDN Network or damage may result.

The SIMLine can function in two modes:

Stand-alone simulation

Connected to a PC for monitoring the simulation

**Stand-alone operation**

In this mode the SIMLine is disconnected from the host PC and reset by switching the power off and on.

The POD will turn all the 10 state LED's on and after 10-15 seconds, if the system is functional, will turn all but the PS1 LED's off. Connection can then be made to two pieces of suitable terminal equipment one in each interface. Each interface is marked and has two parallel sockets.

The state LED's can be monitored to indicate the current state of the connections made to the equipment.

**State LED's**

PS1 - Indicates the presence of Network Power Supply 1 also known as the Phantom Power.

| | | |
|---|---|---|
| PH | - | Indicates the physical or electrical signaling is present and synchronized. |
| DL | - | Data Link Layer is active. Indicates the Terminal has been allocated an address and has established communications. |
| B1 | - | Indicates B channel 1 has been connected to the Network. |
| B2 | - | Indicates B channel 2 has been connected to the Network. |

**PC operation**

The SIMLine POD can be connected to the parallel (printer) port of a suitable IBM compatible PC. This allows for configuration of the POD and Monitoring /Analysis of the SIMLine operation. The Monitoring/Analysis function is optional and requires the POD to be configured when supplied. Up-grade is possible using a specially supplied software program.

Connection is made using the supplied 25 way cable.

Once the SIMLine software is loaded onto the PC and the parallel port configured the SIMLine program can be run.

On start-up the software will reset the SIMLine POD and then read the POD serial number and display which features have been enabled.

e.g. analysis enabled

The POD will then start-up as in Stand-alone mode and begin simulation. During this phase before any Capture file has been started the POD configuration can be read modified and fixed, then

saved in a profile. In order to achieve this use the default profile as outlined in the section Profiles.

Note: as the Capture is started the POD will be temporarily loaded with the configuration from the Profile loaded into the PC. When the POD is used in standalone mode it will then return to its fixed configuration parameters.

Once a Capture file has been started the Setup features are disabled.

When the Capture file is running all messages from the POD will be logged to disc file and displayed on the screen. The display screen can be manipulated to look at the events whilst logging continues in the background.

When the logging is stopped or the PC program is exited the POD simulation session is over and the POD reset for the next session.

**Terms used**

| | |
|---|---|
| Profiles - | a configuration file used to automatically setup the SIMLine environment |
| Events - | a message or change of state that has been noted |
| Capture - | the current recorded events in this session |
| Review - | old events from a previous capture session |

# PC Software Installation

**Requirements:**

IBM Compatible PC computer with at least 1 printer port.
DOS 3.3+
3.5" floppy disk drive.
600KB hard disk space + space for logging.
Back-up floppy disk

Note: before installing SIMLine, make a copy of the SIMLine installation disk.

**Installing software:**

Change the current directory of the hard disk drive to the root by entering cd\ at the DOS prompt (C:\>).

Insert software disk into your computer's floppy disk drive.

At the DOS prompt (C:\>), type your computer's floppy drive designator (e.g. A:\ [press enter]), then type :

INSTALL <source> <destination> [press enter]

use your required drive designator in both source and destination.

e.g. INSTALL A: C:

Note: destination must be a hard disk drive with no sub-directories specified as SIMLine will set up its own required sub-directories.

Note: if copying a new version of the software onto an older version

all the relevant files will be overwritten. If you have changed the original profiles then make a copy of the changed profiles to another directory or make a note of the changes so that the new profiles can be quickly modified.

**Testing SIMLine PC software:**

Change the current drive to your destination and then change directory to \SIMLINE. Run the software by typing SIMLINE at the DOS prompt.

With no POD attached you should see messages followed by the main screen. Pressing ESC will bring up the top menu that you can browse through using the arrow and enter keys.

At this stage we need to install and configure the POD, so exit the software by pressing F10 or ALT X.

**Connecting the ISDN S0 POD**

The POD can be powered by either the 9v DC adapter as supplied or using the internal re-chargeable batteries. When first received the POD should be charged up but the adapter can be fitted and connected to the mains supply to boost the charge.

Insert the power connector into the socket on the pod marked POWER and then plug the adapter into the mains supply and turn on the supply. Make sure at this stage that the green power LED on the POD is off. If not, turn off using the power switch on the side of the POD.

Connect the ribbon cable to the POD PC PORT and then connect the other end to the PC printer port. Turn on the PC and then switch on the POD.

Run SIMLine again on the PC by changing to the \SIMLINE sub-

directory and typing SIMLINE. The POD may be found by the software and downloaded. If this did not occur then try 2 or 3 times. If it still has not been found it is probably due to wrong configuration.

**Configuring the PC port**

Normally a PC has just 1 printer port LPT1 but may have 2 ports LPT1 and LPT2.

These may be positioned in the computers address map in one of three places:

03BC 0378 0278

Normally LPT1 is positioned at 0378 and LPT2 at 0278 but these may change and hence the SIMLine software needs to be re-configured.

To re-configure the software run SIMLine and go to the SETUP MENU. Then select the PARALLEL PORT options and move to the desired port address. Select the address by moving the green line to the option and pressing the space bar to select that option. Exit the menu by <ESC> or <enter> then exit SIMLINE using EXIT option. This will prompt you to save the current 'default' profile which you should do to save the change. Once saved then SIMLine will exit.

Try running SIMLine again using the new setting to see if the POD can be found.

One of the addresses should produce satisfactory communications with the POD. If not check all connections and repeat.

# Profiles

Profiles are used to set up the whole environment of the SIMLine allowing for quick operation once the desired configuration has been set. These files are saved in the PROFILE sub-directory and can be read and edited by a normal text editor. Alternatively, parameters can be changed by setting up within the SIMLine environment and saving the file using the PROFILE menu.

an example of the default profile is:

**PROFILE =DEFAULT.SLP**
**DESCRIPTION =D channel simulation default**
**POD_TYPE =BRISDN**
**POD_PORT =378**
**POD_PORT_MODE =NIBBLE**
**PRINTER_PORT =LPT2**
**NET_INT_1_MODE =NET SIMULATION**
**NET_INT_2_MODE =NET SIMULATION**
**NET_INT_1_PS1_MON =OFF**
**NET_INT_2_PS1_MON =OFF**
**SIG_PROTOCOL =EUROISDN**
**SIG_DISPLAY_MODE =COMPLEX**
**CAPTURE_FILE_PATH =\SIMLINE\LOG**
**CAPTURE_FILE_NAME =d_log.SLE**
**EVENT_DESCRIPTION =monitor for test purposes**

**CAPTURE_FILE_NAME_MOD =AUTO_INC**
**CAPTURE_FILE_WRITE_MODE =CONTINUOUS**
**MAX_CAPTURE_FILE_SIZE =01024**
**AUTO_START_LOG =NO**

**;simulator call routing**

| | |
|---|---|
| **NUMBERING_OPTION** | **=STD** |
| **CALLED_NUMBER__PRESENTATION** | **=OFF** |
| **CALLED_SUBADD__PRESENTATION** | **=OFF** |
| **CALLING_NUMBER_PRESENTATION** | **=OFF** |
| **CALLING_SUBADD_PRESENTATION** | **=OFF** |
| **HIGH_LAYER_COM_PRESENTATION** | **=OFF** |
| **LOW_LAYER_COMP_PRESENTATION** | **=OFF** |
| **INT1_B1_ADDRESS** | **=1111** |
| **INT1_B2_ADDRESS** | **=3333** |
| **INT2_B1_ADDRESS** | **=2222** |
| **INT2_B2_ADDRESS** | **=4444** |
| **DATA_1__ADDRESS** | **=XXXX** |
| **DATA_2__ADDRESS** | **=XXXX** |
| **ANALOG__ADDRESS** | **=XXXX** |
| **UNALLOCATED_NUMBER** | **=3000** |
| **USER_BUSY** | **=3001** |
| **NO_USER_RESPONDING** | **=3002** |
| **NO_ANSWER** | **=3003** |
| **CALL_REJECTED** | **=3004** |
| **OUT_OF_ORDER** | **=3005** |
| **NO_CHANNEL_AVAILABLE** | **=3006** |
| **TEMPORARY_FAILURE** | **=3007** |
| **INCOMPATIBLE_DESTINATION** | **=3008** |
| **OTHER_CAUSE_ADDRESS** | **=3009** |
| **LOOPBACK** | **=4000** |
| **OTHER_CAUSE** | **=081** |

Most of these parameters control features that can be selected within the SIMLine environment and will be explained in the MENU reference guide.

**Selecting a profile**

Profiles can be included in the SIMLine DOS command line or can be loaded using the PROFILE LOAD menu option.

e.g. SIMLINE SIM_D_C [enter]

this command will run the SIMLine environment and load the profile SIM_D_C.SLP

Once Capture or review is selected you can no longer load the profile as it has to be fixed during that time.

To create a new profile you can run SIMLINE without any profile specified. SIMLine will then use the default profile which can be modified using the SETUP/ CAPTURE menus and then use the PROFILE SAVE AS option to save to a new profile.

AUTO_START_LOG is important because when this is set to YES in a profile loaded from the DOS command line then after the POD has been loaded it will automatically open a new capture file and start logging network activity.

Note. this should be left as NO in the default profile.

# Configuring the POD

After installing the SIMLine software onto the PC and configuring the PC port the POD configuration can be modified.

To achieve this connect the POD and run the SIMLine software with the Default profile.

e.g. SIMLINE <enter>

Once the POD is found the POD configuration can be changed using the SETUP CALL ROUTING menu options.

There are two sets of parameters which can be modified in the Simulation Modes, these are:

SERVICE CONFIGURATION

PORT ADDRESSES

On entry to either of these menu's the option values displayed will be those read from the default profile. To read the current POD settings use the READ POD CONFIG option in the main SETUP menu. This will then read the POD and set the values displayed in the above menu's to the POD values.

The settings can then be modified and when correct the POD config can be fixed by using the FIX POD CONFIG option in the main SETUP menu.

To save the modified settings to a profile use the PROFILE SAVE AS menu option and generate a new profile.

# SIMLine POD Options

### SERVICE CONFIG - NUMBERING OPTION

STD - In this mode each B channel of the POD is allocated a separate number for calling. These numbers are specified in the Port addresses.

AUX - This mode allocates only one number per interface. This number is the number assigned to B1 in the port addresses.

MSN - When selected, 10 consecutive numbers are assigned to each interface. The last digit will range from 0 - 9 and be presented to the attached terminal on an incoming call setup. The number used will be the number assigned to B1 but the last digit will be ignored.

### SERVICE CONFIG - INFO PRESENTED

CALLED NUMBER
CALLED SUBADDRESS
CALLING NUMBER
CALLING SUBADDRESS
LOW LAYER COMPATIBILITY
HIGH LAYER COMPATIBILITY

By selecting these options the information presented to the receiving terminal on an incoming call can be altered. Different implementations and requirements can therefore be accommodated.

### PORT ADDRESSES

This menu allows the port addresses to me modified if required to suit a particular application. It also allows the setting of the special

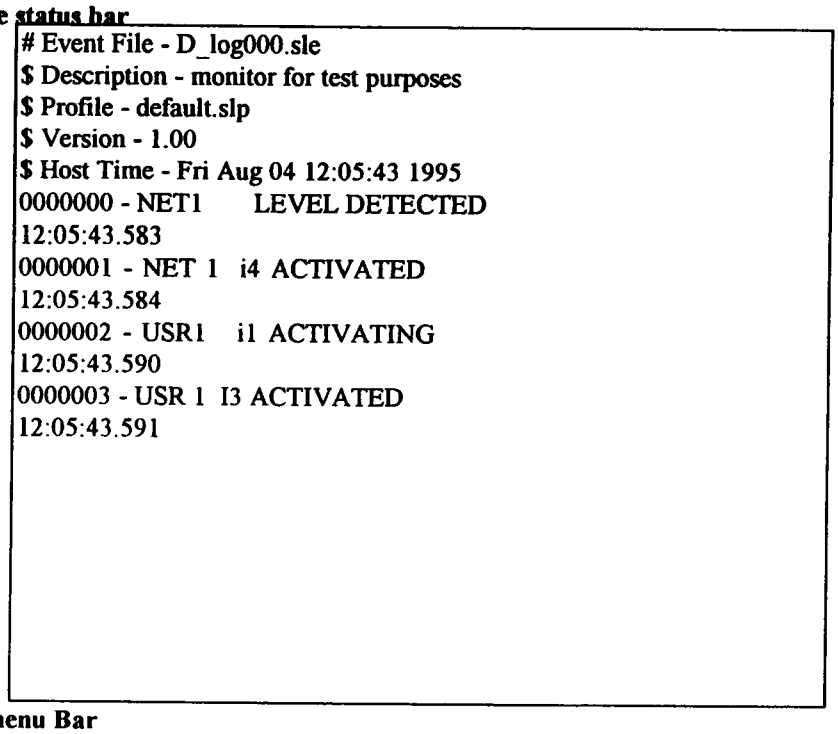
call failure cause values returned for test purposes.

# Screen features

**Top line / menu bar**


**Main display screen**

**Bottom line status bar**




**Top line / menu Bar**


The top line shows the name of the active window and current host

time and date. When ESC is pressed then it changes to the main menu options. Selecting a function will open the pull down menus or pressing ESC again will return the top line to normal.

**Main screen**

The main screen can be selected to show different data via the window menu. This can include both capture and review of signaling events. Whilst events screens are active the mode of the display can be changed using the Display Mode menu to give the events in different formats (Simple, Complex and Hexadecimal). In capture mode Auto-scrolling can be selected to keep updating the screen will the latest events. Auto-scrolling is turned off when the menu's are active but restored when leaving menu mode. If the active window is changed or the display mode is changed then Auto-scrolling is turned off.

Note: the state of the Auto-scrolling is indicated by the yellow S in the blue box in the bottom line status bar. Auto-scrolling is on when the S is present.

Note: the state of the Auto-scrolling can be toggled by pressing ALT-S.

**Bottom line status bar**

The bottom line shows the current Layer 1 (physical) state of the ISDN Network and User equipment. I1 is Interface 1 and I2 is Interface 2.

Network states are the G states
User states are the F states

The SIMLine predicts the current states from the messages that are being transferred. These states are defined in full in the relevant

ITU-T I.430 specification but to be active the Network needs to be in state 3 and the User in state 7.

The mid section of the status bar shows whether or not the capture is running or stopped.

Following this there is a blue box in which the Auto-scroll state is shown:

S present - Auto-scrolling on
no S - Auto-scrolling off

# Menu Options

On-line information is available on each menu option by pressing F1 whilst the option is highlighted.

Note: Some SIMLine menu options may be disabled during part or all of the normal process. This is due to either:

option is out of context

option is not applicable to this model

option is not yet available

**MAIN DISPLAY WINDOW**

Event edit keys:

| | |
|---|---|
| PgUp | PgDn |
| up-arrow | down-arrow |

ESC to go to and from menu mode

Alt-s to turn Auto-scroll on/off in capture window

Alt-x or F10 to exit SIMLine

## MAIN MENU

### PROFILES

Profiles are used to store the working parameters of the SIMLine and allow easy change of the configuration required. Profiles can be loaded as you run the main program by including the name after the run command

e.g. SIMLINE SIM_D_C - this will load the SIM_D_C.SLP file on entry

Once in the SIMLine environment the profiles can be created, loaded and saved using the Profile menu. Working parameters are changed using the Capture, Display and Setup menus. Any parameter changed will be saved to the current profile when PROFILE SAVE AS is selected.

If no profile is selected with the run command then the Default file will be used.

To define a new profile, start with the PROFILE NEW command that will set the SIMLine to the default configuration. After changing the required parameters select the PROFILE SAVE AS command and store it in a new file.

NOTE: profiles cannot be accessed whilst Capture or Review are active

**REVIEW**

Review gives access to previously captured event and call log files. This allows for cross reference to older log files without interrupting the current capture which continues in the background.

Standard edit keys can be used to move up and down through the events and FIND can be used to search for particular events.

Parts or all of the review event files can be transferred to printable text file for printing or editing outside the SIMLine environment.

Call log files are stored in text mode and can be directly accessed by any standard text editor.

**CAPTURE**

Capture is used to control the SIMLine event logging system. Controls are provided to change file names, start and stop capture, transfer events to a printable file and setup the modes of capture file operation.

Standard edit keys can be used to move up and down through the events and FIND can be used to search for particular events.

Parts or all of the capture event files can be transferred to printable text file for printing or editing outside the SIMLine environment.

Call log files are stored in text mode and can be directly accessed by any standard text editor.

**DISPLAY**

Display modes can be changed to allow for the different presentation of data in Simple, Complex and Hexadecimal modes.

Display filter when available will allow for the filtering out of selected events on the display.

**FIND**

Find allows a selection of tools to quickly search for events, times and text information in the event display windows.

**TRIGGER**

When available will allow for delayed start of capture events until a selected event or time has occurred.

**SETUP**

Allows access to the setup options that can be used to setup the system configuration.

Once accessed the SIMLine environment will prompt to save the changes in a profile for use next time if required.

**WINDOW**

Use this menu to switch between the listed display windows.

Note: editing and switching window turns off the Auto-scrolling mechanism so when in Capture events or calls window use ALT-S to update to the latest events.

**EXIT**

Allows exit from the SIMLine environment.
All opened Review and Capture files will be closed before exit.

**HELP**

Allows access to the help information.

**PULL DOWN MENUS**

**PROFILE LOAD**

Loads a selected profile from the PROFILE sub-directory and sets the current configuration with the parameters contained.

This can only be done when Capture and Review are not active.

Note: AUTO_START_LOG parameter is only actioned when a profile is loaded as you enter the SIMLine environment. Otherwise use CAPTURE NEW to start logging events.

**PROFILE NEW**

Sets the profile of SIMLine to the default configuration.

The user can then set the configuration as desired and save to a new profile.

**PROFILE SAVE**

Saves the current configuration to the current file in the PROFILE directory.

**PROFILE SAVE AS**

Saves the current configuration to a new file in the PROFILE directory.

**PROFILE PRINT**

Outputs the current profile to the printer.

Note: it will only do this if a second printer port is available or the POD is not connected to the first printer port.

**PROFILE QUIT**

Allows exit from the SIMLine environment.

All opened Review and Capture files will be closed before exit.

**REVIEW OPEN EVENTS**

Opens a selected event file from the LOG sub-directory for reviewing.

Use edit keys to move up and down through the events and FIND to move quickly to a desired event.

Event edit keys:

PgUp PgDn up-arrow down-arrow
ESC to go to and from menu mode
Alt-s to turn Auto-scroll on/off in capture window
Alt-x or F10 to exit SIMLine

Note: Only one review event file can be opened at any one time.

**REVIEW CLOSE EVENTS**

Closes the current opened review events file.

**REVIEW PRINT**

Transfers events from current review events file to a printable text file for editing or printing using any standard text editor.

Start and stop event numbers are requested to set the boundaries to be printed.

NOTE: Call files are stored as printable text files and an be accessed directly using a standard text editor.

**REVIEW OPEN CALLS**

Opens a selected call file from the LOG sub-directory for reviewing.

Use edit keys to move up and down through the calls.

Call edit keys:

PgUp PgDn
ESC to go to and from menu mode
Alt-s to turn Auto-scroll on/off in capture window
Alt-x or F10 to exit SIMLine

Note: Only one review call file can be opened at any one time.

**REVIEW CLOSE CALLS**

Closes the current opened review calls file.

**CAPTURE FILE NAME**

Sets a new file name for capture events files and the description that will be used in the header of all following capture event and call files.

On entry to SIMLine these will be read from the selected profile and need not be altered until required.

These can be saved in a Profile if required for next time.

**CAPTURE OPEN/CLOSE LOG**

OPEN is used to open a Capture session. The POD will be reset, temporarily re-configured and a new event file opened.

File header information will be placed in the file first and the CAPTURE EVENTS WINDOW will be entered.

The Call logging if enabled will be initiated and can be accessed via the CAPTURE CALL WINDOW.

CLOSE will end the session and close the event file.

Note: Capture of events to a file is started automatically when AUTO_START_LOG is set or CAPTURE NEW FILE is selected.

**CAPTURE PAUSE/CONTINUE**

PAUSE/CONTINUE will allow the capture of events to be temporarily suspended and then resumed. Whilst suspended the POD will continue to function as normal.

**CAPTURE PRINT EVENTS**

Transfers events from current capture events file to a printable text file for editing or printing using any standard text editor.

Start and stop event numbers are requested to set the boundaries to be printed.

NOTE: Call files are stored as printable text files and an be ccesseddirectly using a standard text editor.

**CAPTURE FILE MODE**

Allow capture file modes to be set as follows:

CONTINUOUS - event files will be generated upto the MAX_FILE_SIZE

LOOP - event files will not exceed the MAX FILE SIZE and the latest events will overwrite the oldest events

AUTO INCREMENT - will select a new unique file name each time a new file is started where the last 3 characters of the file name will be numbered 000 to 999

i.e. D_LOG001.SLE

OVERWRITE - each time a file is started it will delete the previous file of that name

**AUTO START LOG**

This parameter can be set and saved in a profile.

When set the Capture event and call logging will start automatically as SIMLine is entered and the POD has been loaded.

Note: this should not be set in the default profile as many parameters cannot be accessed once the Capture logging is active

**DISPLAY MODE**

Three levels of decode are available for events:

SIMPLE - gives full layer 2 and identifies the layer 3 message type

COMPLEX - gives full breakdown of both layer 2 and layer 3 frames

HEX - all bytes contained within the frame are displayed in hexadecimal characters

Layer 1 signaling is identified the same in all modes

**SETUP INTERFACE 1**

The mode of network interface 1 can be configured and the physical aspects altered. In the SIMLine monitor this is fixed but in the products with simulation features this will allow for changes.

**SETUP INTERFACE 2**

The mode of network interface 2 can be configured and the physical aspects altered. In the SIMLine monitor this is fixed but in the products with simulation features this will allow for changes.

**SETUP PROTOCOL**

Sets the protocols used by SIMLine.

Basic Rate ISDN uses the ITU-T Q.921/931 standards.

There are many derivatives of these basic standards which will be supported as required.

**SETUP CALL ROUTING**

Used to set the call routing options of the POD.

**SETUP CALL ROUTING SERVICE CONFIG**

Allows the network simulation options to be changed.
Used in conjunction with READ POD CONFIG and SAVE POD CONFIG.

**SETUP CALL ROUTING PORT ADDRESSES**

Allows the network simulation addresses to be changed.
Used in conjunction with READ POD CONFIG and SAVE POD CONFIG.

**SETUP PRINTER PORT**

Allows configuration of printer port handle. i.e. LPT1 or LPT2

As the SIMLine POD uses a printer port for communication, if printouts are required then a second printer port can be fitted or print using DOS or a simple text editor outside the SIMLine environment.

**SETUP PARALLEL PORT**

Allows configuration of the port address to which the SIMLine POD will be attached.

The POD uses a standard printer port which may be mapped to one of 3 address locations within the computer.

If the port address is not known then try each in turn until communications with the POD is established then save the address in a profile using the PROFILE SAVE menu option.

**READ POD CONFIG**

Used to read the current POD configuration into the SIMLine

environment for display and modification.

**FIX POD CONFIG**

Used to store the SIMLine environment setup options into the POD Flash memory.

# Appendix 1 - Technical Specification

**ISDN S0 POD**

Terminal connections -

Dual Interfaces.
ITU-T I.430 S'bus
2 Parallel RJ45 sockets per Interaface

Power supply

9v d.c. - mains adapter or
rechargeable battery operation
(allows upto 3-4 hours simulation)

PC connection

ribbon cable to standard PC Printer port

Operating temperature

0 - +40 deg. C

Storage temperature

-20 - +50 deg.C

Relative humidity

90% non-condensing

Size 190mm x 140mm x 47mm

Weight 780g

**PC ENVIRONMENT**

PC IBM compatible 386+
1 M RAM
hard disk
printer port

Display modes

| | |
|---|---|
| Complex | - full message breakdown |
| Simple | - layer 2 and layer 3 message type |
| Hex | - frame displayed as hex digits |

Protocols

ETSI EuroISDN others as required

Layer 1

All state changes notified and logged
Current state monitor
(User F states and Network G states are displayed)

Capture file modes

**Table 5-36: parameters displayed in the output of the SHOW ISDN LOG command.**

| Parameter | Meaning |
|---|---|
| Call Name | The name of the call. |
| Start Time | The date and time the call was initiated. |
| Duration | The length of the call for a call that has been completed, or one of "INITIAL" (the call is being set up), "ACTIVE" (the call is still active), "DISCONNECT" (the call is being disconnected) or "CLEARED" (the call was cleared before becoming active). |
| Dir | The direction of the call; one of "OUT" or "IN". |
| Number | The number being called. |
| Cause | The reason for the call being disconnected. The first character is a "U" (disconnected by user) or an "N" (disconnected by network), followed by the Q.931 cause code and (for some causes) the Q.931 diagnostic code. |

**Table 5-37: ISDN Q.931 Call Clearance Cause Codes for ISDN service providers in the European Union (ETSI), New Zealand (NZL) and Australia (AUS).**

| Cause Code | Cause Description | Supported by ETSI | NZL | AUS |
|---|---|---|---|---|
| 1 | Unallocated | Y | Y | Y |
| 2 | No route to specified transit network | Y | Y | N |
| 3 | No route to destination | Y | Y | N |
| 6 | Channel unacceptable | Y | Y | Y |
| 7 | Call awarded and being delivered in an established channel | Y | Y | N |
| 16 | Normal call clearing | Y | Y | Y |
| 17 | User busy | Y | Y | Y |
| 18 | No user responding | Y | Y | Y |
| 19 | No answer from user (user alerted) | Y | Y | N |
| 21 | Call rejected | Y | Y | Y |
| 22 | Number changed | Y | Y | Y |
| 26 | Non-selected user clearing | Y | Y | Y |
| 27 | Destination out of order | Y | Y | Y |
| 28 | Invalid format number | Y | Y | Y |
| 29 | Facility rejected | Y | Y | Y |
| 30 | Response to STATUS ENQUIRY | Y | Y | Y |
| 31 | Normal, unspecified | Y | Y | Y |
| 34 | No circuit/channel available | Y | Y | Y |
| 38 | Network out of order | Y | Y | Y |
| 41 | Temporary failure | Y | Y | Y |
| 42 | Switching equipment congestion | Y | Y | Y |
| 43 | Access information discarded | Y | Y | Y |
| 44 | Requested circuit/channel not available | Y | Y | Y |
| 47 | Resources unavailable, unspecified | Y | Y | Y |

| | | | | |
|---|---|---|---|---|
| 49 | Quality of service unavailable | Y | Y | N |
| 50 | Requested facility not subscribed | Y | Y | Y |
| 53 | Outgoing calls barred within CUG | N | N | Y |
| 55 | Incoming calls barred within CUG at destination | N | N | Y |
| 57 | Bearer capability not authorised | Y | Y | Y |
| 58 | Bearer capability not presently available | Y | Y | Y |
| 62 | Inconsistency in designated outgoing access information and subscriber class | N | N | Y |
| 63 | Service or option not available, unspecified | Y | Y | Y |
| 65 | Bearer capability not implemented | Y | Y | Y |
| 66 | Channel type not implemented | Y | Y | Y |
| 69 | Requested facility not implemented | Y | Y | N |
| 70 | Only restricted digital information bearer capability is available | Y | Y | Y |
| 79 | Service or option not implemented, unspecified | Y | Y | Y |
| 81 | Invalid call reference value | Y | Y | Y |
| 82 | Identified channel does not exist | Y | Y | Y |
| 83 | A suspended call exists but this call identity does not | Y | Y | Y |
| 84 | Call identity in use | Y | Y | Y |
| 85 | No call suspended | Y | Y | Y |
| 86 | Call having the requested call identity has been cleared | N | Y | N |
| 87 | Destination not member of CUG | N | N | Y |
| 88 | Incompatible destination | Y | Y | Y |
| 90 | Non-existent CUG | Y | N | Y |
| 91 | Invalid transit network selection | Y | Y | N |
| 95 | Invalid message, unspecified | Y | Y | Y |
| 96 | Mandatory information element is missing | Y | Y | Y |
| 97 | Message type non-existent or not implemented | Y | Y | Y |
| 98 | Message not compatible with call state or message type non-existent or not implemented | Y | Y | Y |
| 99 | Information element non-existent or not implemented | Y | Y | Y |
| 100 | Invalid information element contents | Y | Y | Y |
| 101 | Message not compatible with call state | Y | Y | Y |
| 102 | Recovery on timer expiry | Y | Y | Y |
| 111 | Protocol error, unspecified | Y | Y | Y |
| 127 | Interworking, unspecified | Y | Y | Y |

**See Also** DISABLE ISDN LOG
DISABLE Q931 DEBUG
ENABLE ISDN LOG
ENABLE Q931 DEBUG
SET ISDN LOG