EMUTEL *Virtuoso*

V5.X Product Manual

The Emutel Rack   The **Emutel Rack** simulates a Central Office switch. Depending on which cards are inserted the switch can emulate basic rate ISDN, primary rate ISDN, V5.1, V5.2, analogue telephone networks.

A call on any bearer channel on any interface can be connected to any other bearer channel on any other interface.

The setup and configuration of the EMUTEL is achieved via a Windows application program. Also available as a software option is a protocol analyser.

The manual   This manual outlines how the **Emutel Rack** should be set up and how the network and terminal equipment is connected.

ISDN Connections   The **Emutel Rack** can simulate, basic rate ISDN on either an S_0 or U interface, analogue, primary rate ISDN on either E1 (S_{2m}) or T1, V5.1 and V5.2 on up to 8 E1 (S_{2m}) links.

Terminal Port   A V.24 port is provided allowing the connection of a PC for configuration and analysis of the unit.

Ethernet Port   An IEEE 802.3 Ethernet port is provided for connection to a local area network.

LED's indicate (1) network present, (2) network activity.

Modem Port   A modem port is provided to allow the **Emutel Rack** to be controlled remotely.

LED's indicate that the modem is (1) off hook, (2) ringing.

Power   The **Emutel Rack** is available in mains powered and dc powered versions. The mains version accepts a voltage of 110-240V AC (50-60Hz). The dc version accepts a voltage of –36V to –72V DC

Introduction   The **Emutel Rack** consists of a chassis, mains or dc power supply, controller card and up to 2 line cards.

The controller card must be fitted in the first slot.

There are no user serviceable parts inside the **Emutel Rack**. Removal of the case by unauthorised staff will result in a void of warranty.
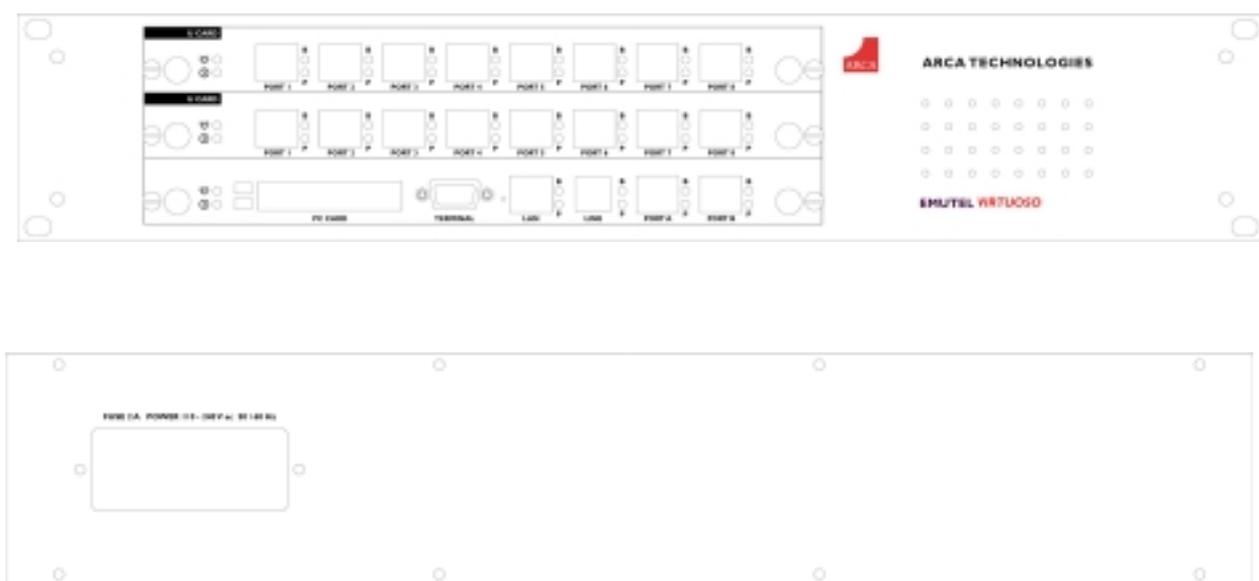
Figure 1   **Emutel Rack** front and rear panels

Chassis   The chassis consists of a metal case and a back plane to accept the controller card, line cards and power supply.

Mains Power supply   The mains power supply has a universal input suitable for 110V-240Vac/50-60Hz. Connection to any other source may result in the unit failing to comply with safety requirements.

Power should be supplied via an IEC mains lead (supplied).

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The power supply must have a protective ground (earth). If not the mains filter will force the metal case to a voltage equal to half the mains supply voltage.

`DC power supply` The dc power supply has 2 input connectors. Both accept a voltage of –36V to –72V. Power can be connected to either or both input connectors.

NB the 0V connections on both connectors are common and are connected to the case.
The 0V connection should be connected to earth.

Figure 2   **Emutel Rack** controller card

`Controller card` The controller card can feature 2 primary rate ports, 2 PC Card slots, modem, LAN port, terminal port and LED's.

The terminal port is a V.24 compatible control port to which a PC running the application provided could be connected.

The LAN port is an IEEE 802.3 compatible Ethernet port.
It allows the **Emutel Rack** to be controlled remotely via Telnet. Software upgrades are possible via FTP.

The Line port is the modem port. This is not enabled for this product.

Port 1 and port 2 are the

Pin-outs of the terminal, Ethernet, modem and PRI ports are given in an appendix.

LED's indicate power and alarm.

For each primary rate port the P LED is on when both physical link layer and data link layer are active. It flashes when only the physical link is active. The B LED is on when any B channel is in use.

For the Ethernet port the P LED indicates network present and the B LED indicates network activity.

For the modem port the P LED is on for off-hook and flashing for ringing. The B LED indicates data transfer.

Figure 3   **EMUTEL** *VIRTUOSO* U card and S card

`U and S cards`   The U and S cards feature 8 Basic Rate Ports and LED's.

Ports 1-8 are BRI 1-8 if fitted in the first line card slot or BRI 9-16 if fitted in the second line card slot.

Pin-outs of the BRI interfaces are given in an appendix.

LED's indicate power and alarm.

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For each port the P LED is on when both physical link layer and data link layer are active. It flashes when only the physical link is active. The B LED is on when any B channel is in use.

Restoring default settings

When the unit is first switched on the terminal port will default to 19200-baud, no parity, 8 data bits and 2 stop bits and will search for a <ctrl-c> being transmitted to the *EMUTEL VIRTUOSO*. If this occurs the *EMUTEL VIRTUOSO* will restore the factory defaults otherwise it will use the stored settings.

If a setting has been changed and the *EMUTEL VIRTUOSO* ceases to operate, powering up the *EMUTEL VIRTUOSO*, while holding down <ctrl-c> for the first 20 seconds will restore a working configuration to the *EMUTEL VIRTUOSO*.

The default settings are listed in an appendix.

Figure 4   **EMUTEL *VIRTUOSO* V5 card**

V5CARD

The V5card features 8 E1 Ports and LED's.

Pin-outs of the PRI interfaces are given in appendix II.

LED's indicate power and alarm.

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For each port the P LED is on when both physical link layer are active. It flashes when only the physical link is active. The D LED is on when any of the data link layers are active.

Unpack the Emutel *Virtuoso*   First unpack the *Virtuoso* and check for signs of damage in transit. If the unit or packaging is damaged this should be reported immediately to Arca Technologies.

Take an Inventory   Assuming there is no damage, take an inventory of the parts supplied. Check that the items ordered were actually received. The list below should be of help in identifying each part.

- *Virtuoso* V5 Local Exchange Simulator
- Cables for ISDN - RJ45-RJ45 (4 off)
- Mains Cable
- Terminal Cable DB9-DB9 (1 off)
- This Manual

Connect to a PC or terminal   Plug the terminal cable into the terminal connector on the controller card at the front of the unit and connect to a PC.

(***Virtuoso*** default terminal settings are ANSI terminal compatible, 115200-baud, 8 data bits, no parity, 2 stop bits).

Connect power   Plug the power cable into the rear of the unit and switch on

(***Virtuoso*** will work on 110V or 240V mains supply without adjustment).

Connect terminal equipment   E1 links can be connected to the Emutel Virtuoso using the RJ-45 cables provided. For V5.2 the Primary and Secondary links port is defined in the configuration file.

SOFTWARE INSTALLATION

Software installation

The Emutel *Virtuoso* is controlled using the Emutel Windows application. The Emutel Windows application is capable of running on a PC with windows 95/98/2000 and NT operating systems

Installation of software

The Emutel Windows application and V5analyser can be installed using the CD provided. Selecting **DISK1** from the **DISK IMAGES** file
Select the **setup** icon and follow the on screen instructions Once completed the software will installed on your local drive **c:\programme files\Digital Engineering Ltd**.

Digital Engineering Ltd Folder contents

This folder contains.

- Emutel Windows Application (**v5rack)**
The V5RACK is used to control the configuration and display the current state of each port of the Emutel *Virtuoso*.

- V5Analyser
The V5Analyser displays to the user full decoding of the V5 protocol and ISDN protocol as well as providing statistical analysis

-V51config.V52
The V51CONFIG file is a template for the text file used to configure the EMUTEL *VIRTUOSO* to the customers requirement for a V5.1 interface

-V52config.V52
The V52CONFIG file is a template for the text file used to configure the EMUTEL *VIRTUOSO* to the customers requirement for a V5.2 interface

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Introduction to the windows application

Before using the Emutel *Virtuoso* you must set the configuration of the Emutel *Virtuoso* to match that of the corresponding Access Network. This done using the Emutel Graphical User Interface shown as a DigApp icon in the installed directory.

To connect the V5RACK to the Emutel *Virtuoso* use the RS-232 cable provided. Connect the RS-232 cable to the nine-way D-type connector situated at the front of the Controller card.
Using the V5RACK menu set the RS-232 port settings as shown below.
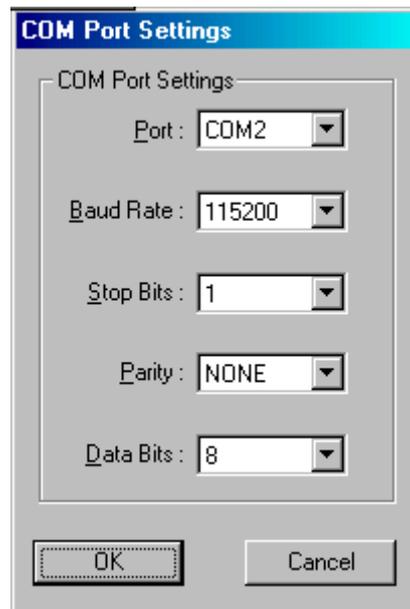
From the menu select Comport -> Connect. After a short time lag, the V5RACK application will display the current configuration of the Emutel *Virtuoso*.

Changing the configuration

To change the configuration the user need to generate a new text file that meets their configuration requirements (Text file format). Once the text file has been generated the user can upload the configuration to the unit. Select **File -> Open**. Choose the required file to be uploaded to the Emutel *Virtuoso*. If the file has been uploaded correctly the new ports displayed on the screen will match the text file.

Once configuration has been completed the User should restart the system **Interface -> Restart Link** or by power cycling the unit. On restart the Unit will start up with the Access Network.

A full description of the V5RACK functions is given in section

Connecting the V5analyser

Using the V5RACK menu select **Analyser -> Analyser -> analyser on**. This will enable the Emutel Virtuoso to transmit Analyser message.

From the Digital Engineering Directory open the V5Analyser.

To connect the V5Analyser click the mouse button on the icon shown below.

A successful connection will display the following window.

Analyser messages will now be displayed.
Further information on the analyser menus can be found

Conclusion

The user can now use the Emutel Virtuoso Local Exchange Simulator from this set of instruction to ensure that their equipment is set up correctly. More detailed explanation of the user function on the

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V5RACK and V5Anayser are detailed in later chapters.
Telephone numbers for the Emutel Virtuoso are supplied in Appendix 1.

Introduction to fault finding

Due to the nature of the V5 protocol care must be taken when changing the configuration of the unit. Here are some examples of operator error that may help eliminate initial problems.

Unable to connect to the Emutel Virtuoso using the V5RACK

This problem occurs often; first the user should ensure that the port settings are correct. If the problem persists further then:
- Using a Dumb terminal, such as HyperTerminal set the Baud rate to 19200.
- Power cycle the unit.
- On power up press CTRL + C.
- Reset should be continuously displayed on the screen.
- Release the Keys until the Digital Engineering copyright screen appears.
- Press Enter and then Enter into the Hardware setup menu.
- Using the Space bar change the Baud Rate of the unit to 115200 and press ESC.
- Closed down the Dumb terminal and try to connect to the unit again

Configuration errors

After uploading a new configuration file to the Emutel *VIRTUOSO*. If the change in configuration on restart have not taken place, power cycle the unit and reconnect to the Emutel *VIRTUOSO* using the Emurack application. If the configuration changes have not taken place then the problem have occurred due to;

1. **Incorrect configuration for version.** The user may be trying to upload a configuration that does not match the allowed configuration of the unit. Check with your local dealer or purchaser to detail the configuration limitations set at time of purchase.
2. **Incorrect configuration.** The text file that is used to generate the configuration file has errors in it. This could be due to missing text, incorrect text, invalid configuration text. Check the text file for and mistakes such as duplicated layer3 addresses on the same system.

File -> Save	This enables the user to save the units current configuration to file.
File -> Open	Opens a configuration file and uploads it to the Emutel *Virtuoso*. Configuration files are of type *.V52
Interface -> Restart Link	Used to restart the E1 Link. Commonly used after the unit has been reconfigured to update the configuration on the unit.
Interface -> Request Link config	This function enables the user to view the current Link configuration of the Emutel *Virtuoso*
Analyser -> analyser	Enables the Emutel Virtuoso to send analyser messages to the V5protocol analyser.
Analyser -> TCP/IP Settings	Not enabled on this version of software
View -> System Messages	Enables the user to view all the messages and decoding that are being passed too and from the Emutel Windows application to the Emutel *Virtuoso*
View -> Racks -> Data links	The Data links rack displays the V5 Protocols currently being used, such as BCC, PSTN and CTRL

View -> Racks -> E1 Racks	The E1 rack will display the current links that are currently configured at the Local Exchange. From this rack the user can extract and request various information about the E1 Link status.

Hovering over the specified E1 link and using the right mouse button will display another menu.

Hidden Menu

Blocking -> immediate
The Local Exchange will immediately block the link.

Blocking -> Deferred
The Local Exchange will not block the link until all the current B-channels that are in use are returned to the null state

Blocking -> Non-deferred
The Local Exchange will block the link regardless of whether any B-channels are in the active state.

Blocking -> Unblock
The Emutel *Virtuoso* Local Exchange simulator will send and Unblock Request the V5 Access Network for the required E1 link.

ID Request
This messages will invoke the Emutel *Virtuoso* to send an id request out on that particular Link.

Info Request
The info request message will ask the Emutel *Virtuoso* return all the relevant port information. This information will be displayed in the systems messages window after API_LINK_INFO_CO.

Hovering over the Link with the mouse pointer will encapsulate a windows displaying all the relevant information for that E1 link (as below)


```
Link No.: 1
L3 Address: 1
Type: PRIMARY_LINK
16_Type: LOGICAL_TS
16_LCC: 1
15_Type: NORMAL_TS
15_LCC: 2
31_Type: NORMAL_TS
31_LCC: 1
```

Graphical Information
The Graphic that represent the link also translate information to the user.
The LED at the centre of the Icon will turn Red when the link is active.
When the Link is blocked the coloured bar at the bottom of the link is Red when the Link is unblocked this will change colour to Green.
The number that is displayed in this Bar represents the Layer3 address of this Link.

View -> Racks -> ISDN Racks

Each ISDN rack will display 15 Basic Rate Interfaces within this graphical feature the user can send and extract a variety of information about that port.

Hovering over the required Basic Rate Interface with the mouse pointer the user can right click on the icon to reveal a hidden menu

Hidden Menu

Block Port
This command initiates the Emutel *Virtuoso* to send a port block request to the Access Network top block that particular port. The port will then enter the OUT OF SERVICE state.

Unblock Port
The Unblock Port command enables the Emutel *Virtuoso* to request that a particular port be unblocked to the Access Network. If this is successful the port will enter the AN1 NULL state.

Get Port Info
The Get port Info command enables the user to gather all the information about that port that is currently available.

Port Status -> Activate Access

Port Status -> De-activate Access

Port Status -> Unblock Request

Port Status -> Block Indication

Port Status -> Activate Loopback
Not Applicable to this Version of code

Port Status -> Activate Partially
Not Applicable to this version of code

Port Status -> De activate T
Not Applicable to this version of code

Hovering over the Port icon with the mouse pointer will encapsulate a window displaying all the relevant information for that BRI (as below)

This displays to the user the
-BRI number
-The port Layer3 address
-B1 timeslot (V5.1 only)
-B2 timeslot (V5.2 only)

<u>Graphical Information</u>
The Graphic that represent the Basic Rate Interface
also translate information to the user.
The Graphic has four LED`S :

P-LED – When the P LED is red this means that the
Physical layer is active for this particular BRI.

D-LED- When the D LED is red this means that the
D-channel for this particular BRI is active.

B1-LED- When the B1 LED is red this means that the
B1-channel for this particular BRI is currently in use.

B2-LED- When the B2 LED is red this means that the
B2-channel for this particular BRI is currently in use.

When the BRI is blocked the coloured bar at the
bottom of the link is Red when the BRI is unblocked
this will change colour to Green.
The number that is displayed in this bar represents the
Layer3 address of this Link.

View -> Racks -> PSTN Racks

Each PSTN rack will display 30 PSTN ports, within this graphical feature the user can send and extract a variety of information about each port.

Hidden Menu

Block Port
This command initiates the Emutel *Virtuoso* to send a port block request to the Access Network top block that particular port. The port will then enter the OUT OF SERVICE state.

Unblock Port
The Unblock Port command enables the Emutel *Virtuoso* to request that a particular port be unblocked to the Access Network. If this is successful the port will enter the AN1 NULL state.

Get Port Info
The Get port Info command enables the user to gather all the information about that port that is currently available.

Hovering over the Port icon with the mouse pointer will encapsulate a window displaying all the relevant information for that PSTN port (as below)

PSTN: port number.
L3: Port Layer3 address
TS: allocated timeslot number (V5.1 only)

Graphical Information
The Graphic that represent the Basic Rate Interface also translate information to the user.
The Graphic has four LED`S :

RG LED. The Ring LED will flash red when the PSTN port at the Access Network is ringing.

HK LED. The Hook LED will illuminate red when the PSTN port at the Access Network is off hook.

When the PSTN port is blocked the coloured bar at the bottom of the link is Red when the PSTN port is

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unblocked this will change colour to Green.
The number that is displayed in this bar represents the Layer3 address of this Link.

Comport -> port settings

This function enables the user to set up the RS 232 port options. The options are displayed in the graphic below. The fields should be filled in as shown on the graphic below (except the comport number)
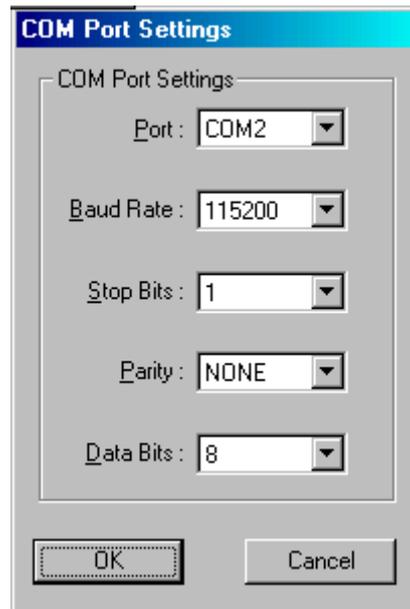
Comport -> Connect

Connects the Emutel Windows application to the Emutel *Virtuoso* via a RS-232 link.

Comport -> Disconnect

Disconnects the Emutel Windows application form the Emutel *Virtuoso*

V5rack information board

The V5 rack information board is located just under the window menu. The function of the information board is to make available to the user certain information about the Emutel *Virtuoso*.

Hovering over each of the ports displays port information on this board. The field parameters for this information are supplied below.

First row field information

Interface

Displays the type of interface that is available V5.1/V5.2 depending on options available at time of purchase.

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`Links`	The number of links that are available on user Emutel *Virtuoso*
`Analyser`	Enable the user to determine if the analyser has been fitted to the Unit.
`Serial Number`	Displays to the User the Emutel *Virtuoso* serial number
`Version`	This will display the Version number of the firmware.
`Date`	Represents the date of the software version

<u>**`Second row field information`**</u>

Box1. This box will contain either of the messages listed below.

Connected - The Emutel windows application is connected to The Emutel Virtuoso via a RS-232 connection.
Disconnect- The unit is connected to nothing

Box2. This box will contain either of the messages listed below.

Connected - The Emutel windows application is connected to The V5analyser via a Winsock.
Disconnect- The V5analyser has not been detected or is not connected to the application.

Box3 B1 timeslot will be displayed when hovering over a port here.
Box4 B2 timeslot will be displayed when hovering over a port here.

<u>Third row field information</u>

Box 1 Displays the current port state
Box 2 Displays the port Number
Box 3 Displays the Layer3 address of the Port

The Emutel configuration file	The Emutel Windows application software will have been supplied with two files in the directory called v51config.v52 and v52config.v52.
	These two files are simply text files that allow the user to edit the configuration of the unit to match that of the Access Network. Below is an explanation to the text requirement of the files.
[V51]	On upload this indicates to the Emutel *Virtuoso* that the configuration will be V5.1
[V5.2]	On upload this indicates the Emutel *Virtuoso* that the unit is V5.2
Variant Id	The user can change the variant Id to match the Access Network. If the Variant Id does not match the AN equipments Variant Id the interfaces will fail to start up together.
Interface Id	The user can change the interface Id to match the Access Network. If the Variant Id does not match the AN equipments interface Id the interfaces will fail to start up together.
Ctrl_lcc_id **pstn_lcc_id** **bcc_lcc_id** **link_lcc_id**	This number represents the Logical C-channel Id. This number is define at the Link configuration and will determine the timeslot that Ctrl protocol is implemented. Due to the restriction of V5.1 these values should be set to 1.
[BRI PORTS]	Informs the Emutel *Virtuoso* that the following information represents the systems Basic Rate Interfaces.
BRI	This text followed by a number represents the Basic Rate port number.
l3_address	Enables the user to set the Layer 3 address of the desired port
ds_lcc_id **(V5.2 only)**	This function enables the user to set the Logical C-channel that ISDN D-type (SAPI 0 calls)
p_lcc_id **(V5.2 only)**	This function enables the user to set the Logical C-channel that ISDN P-type (SAPI 16 calls)

f_lcc_id
(V5.2 only)

This function enables the user to set the Logical C-channel that ISDN F-type (SAPI 32 - 62 calls).

Time_slot_B1
(V5.1 only)

This function enables the user to allocate the timeslot value for the B1 channel.

Time_slot_B2
(V5.1 only)

This function enables the user to allocate the timeslot value for the B2 channel.

[PSTN PORTS]

Informs the Emutel *Virtuoso* that the following information represents the systems PSTN ports

PSTN

This text followed by a number represents the PSTN port number.

l3_address

Enables the user to set the Layer 3 address of the desired port

time_slot
(V5.1 only)

This function enables the user to allocate the timeslot value for the pstn port.

[E1 LINKS]

Informs the Emutel *Virtuoso* that the following information represents the systems E1 links

LINK

This text followed by a number represents the Link number.

Type

This function enables the user to set the Link to three types
- PRIMARY_LINK
- SECONDARY_LINK
- NORMAL_LINK
- UNUSED_LINK

PRIMARY_LINK
Primary Link identifier to the V5 system. Each V5.2 system must have a Primary link defined.

SECONDARY_LINK
Secondary Link identifier to the V5 system. Each V5.2 system must have a Secondary Link defined.

NORMAL_LINK
 The normal link defines any active link that is not Primary or Secondary.

UNUSED LINK

An unused link defines a link that is not to be used in the new configuration.

l3_address

Each link must have a Layer 3 address

ts_16_type
ts_15_type
ts_31_type

The timeslot (ts) type for each communication channel has three options.

- **LOGICAL_TIMESLOT This** value sets the particular timeslot on that link to be a logical C-channel.

- **STANDBY_TIMESLOT** This value sets the particular timeslot on that link to be a standby timeslot. Standby timeslots should only be configured on the secondary link.

- **NORMAL_TIMESLOT** This values set the particular timeslot on that link to be a normal Bearer Channel.

Note

Each line must in a semi colon else upload to the Emutel *Virtuoso* will be unsuccessful.

FILE -> OPEN CAPTURE	Opens a previously saved binary capture. Previous traces saved as a binary file will be of type *.CAP. The Open Capture command will default to the Windows Desktop directory. **Shortcut key (Ctrl + O)**
FILE -> SAVE AS (ASCII)	The current trace will be saved as a text file (*.txt) and can be retrieved using a simple text editor. **Shortcut key (Ctrl + S)**
FILE -> SAVE AS (Binary)	The current trace will be saved as a binary file (*.CAP). This file can only be retrieved using the V5Analsyer software.
FILE -> Load Configuration	Loads in a saved configuration file, which can be applied to a current trace.
FILE -> Save configuration	Writes the current configuration of the V5Analyser to file for future use.
FILE -> Load Filter	Retrieves a previously stored filter for use on a saved file, display file or the current history buffer.
FILE -> Save filter	Writes the current filter settings to file for retrieval at a later date.
FILE -> Exit	Exits the V5analyser application. **Shortcut key (Ctrl + X)**
Monitor -> Connection	Enables the V5analsyer to receive analyser message from the Emutel Graphical User interface. Ensure that analyser is enabled in the Emutel application. **Shortcut key (Ctrl + C)**
Monitor -> Disconnection	Stops the V5anlayser buffers receiving messages in the history buffer. **Shortcut key (Ctrl + D)**
Monitor -> Start Recording	Begins writing incoming analyser messages file. This function can be use for long periods of testing where the history buffer may not be big enough to hold all the required messages.
Monitor -> Stop Recording	Prevents further incoming messages from being

written to file.

Monitor -> Pause

Stops the current display from scrolling and continues writing analyser messages to the history buffer or file.

Monitor -> Stop (Play & Record)

Stops recording to the file and prevents further analyser messages being displayed.

Monitor -> Clear History Buffer

When beginning a new trace it is important to ensure that the history buffer is cleared. This avoids confusion during analysis.

Monitor -> Display Led Panel

Displays the Link configuration using a graphical display panel located in a small window above the analyser message. These LED`s. graphically display the links that are to be monitored and the direction which the messages are being monitored.

Monitor -> Display Status Bar 2

Enables the bar beneath the analyser window. This enables the user to view the Path and Name of the current Record file and the current configuration file

|	
`Analyzer`	Displays the path of the capture file for the current Analyser trace.
`Search -> Find`	Enables the user to search the current trace for a particular string of text. The search window gives an option to search file in required direction (up or down). The search criteria can be set to be case sensitive. **Shortcut Key (Ctrl + F)**
`Search -> Next`	The next command enables the user to search for the required string of text again in the same direction as defined in the original search. This operation can be used repeatedly to search the whole file. **Shortcut Key (F3)**
`Search -> Previous`	The previous command enables the user to search for the required string of text as defined in the original search in the opposite direction the original search criteria. This operation can be used repeatedly to search the whole file in this direction. **Shortcut Key (F2)**
`Markers ->  Go to marker 1`	Moves the cursor line to a predefined first marker point. Used in large traces to jump to the start of a significant event. **Shortcut Key (F5)**
`Markers ->  Go to marker 2`	Moves the cursor line to a predefined second marker point. Used in large traces to jump to the end of a significant event. **Shortcut Key (F6)**
`Markers -> Set marker 1`	This function allows the user to mark the starting point of a trace that may be a significant point of interest in a large file. The user can find this part of text quickly using the shortcut key F5. **Shortcut Key (Ctrl + F5)**
`Markers -> Set Marker`	This function allows the user to mark the end point of a trace ending the user interest in the trace. The user can find this part of text quickly using the shortcut key F6. **Shortcut Key (Ctrl + F6)**
`Tools -> triggers -> trigger`	The trigger function can be used to begin a recording

action   action to a file. The triggering function allows the user to trigger on a particular event in Layer1, Layer2 and Layer3. The triggering action allows this function to be set up. Within this function the user can enable or disable triggering, define the action to be taken i.e. record to file. This function also enable the user to define the size of the triggering file by selecting the number of messages to be stored before the selected event has occurred and the number of messages after the selected event has occurred. This controls the size of a trace and enables the user to look for a certain event, which may occur in a bulk call test over a period of time.
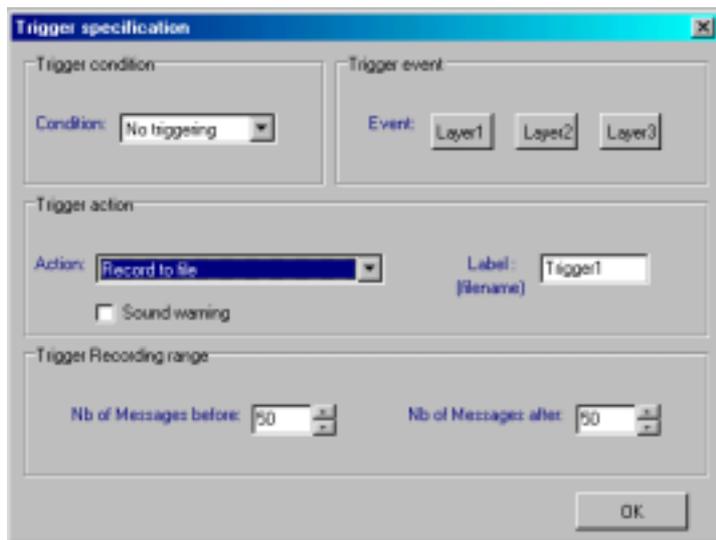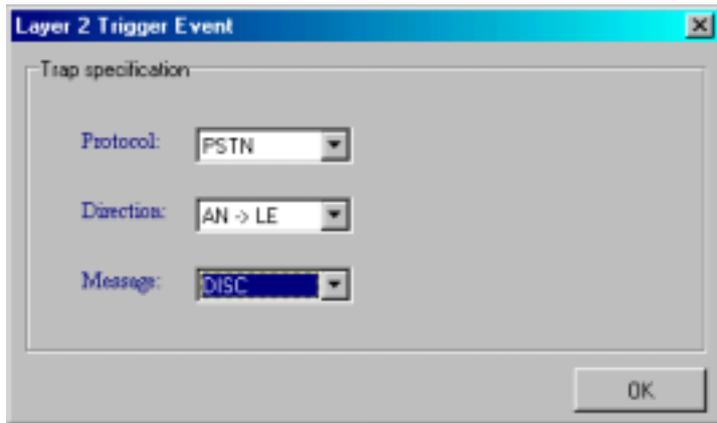

Tools -> triggers -> Layer 1 triggering event   Enables to user to define the criteria for triggering a record to file due to a particular Layer 1 event occurring
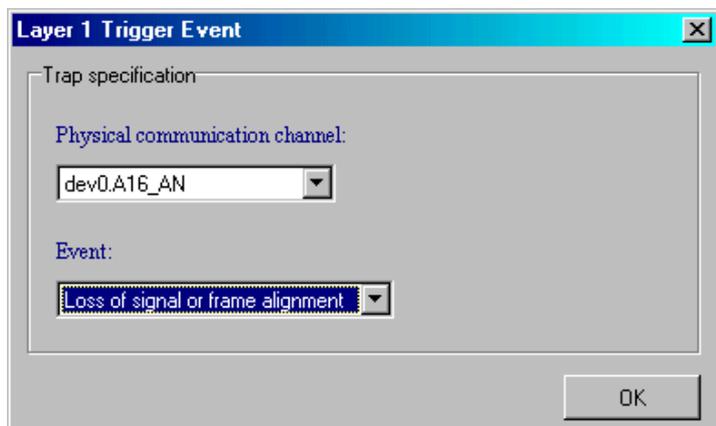
Tools -> triggers -> Layer 2 triggering event   Enables to user to define the criteria for triggering a record to file due to a particular Layer 2 event

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occurring. This includes the direction of the message, the protocol (BCC,PSTN ISDN etc) and the message.

Tools -> triggers -> Layer 3 triggering event

Enables the user to define the criteria for triggering a record to file using three methods

1. Checking for a specific message
2. Checking for a specific pattern in layer 3
3. Using a combination of options 1 and 2 however you must specify the 'Logic' between the trap (1) and (2): the layer 3 trigger event is verified if trap (1) and trap (2) are verified, or only if one of the trap is verified.
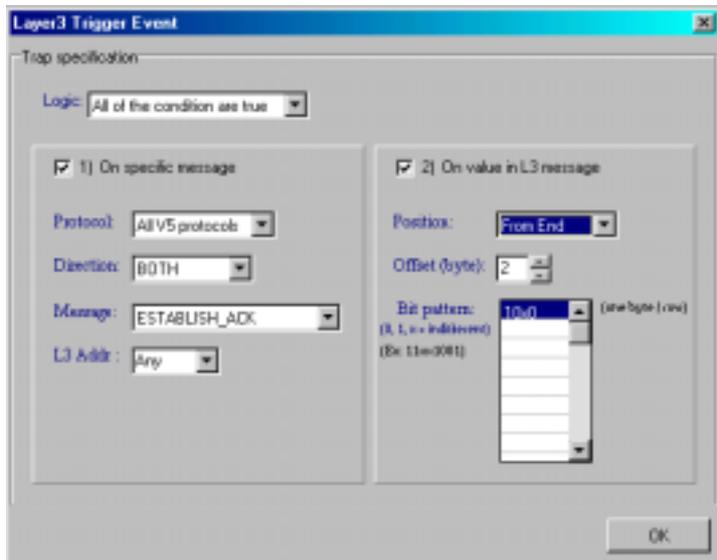
1.Checking for a specific message

The data to trap is defined by a specific protocol message (or 'Any'), by a network direction (From -> to; *AN* = Access Network & *LE* = Local exchange), and by an L3 address entered in hexadecimal value (or 'Any').

2.Checking for a specific pattern

This is especially useful when you are looking for a sequence in signalling data. The data to trap is defined with a specific pattern to find in layer 3 messages.

A pattern is a sequence of bytes. Enter the pattern as a consecutive sequence of bytes (one byte per line) in the area named "Bit pattern": each byte is represented by its 8 bits value (0 or 1 or "x" meta-character). Meta-character "x" is also allowed: "x" means any byte value in that position is fine.

Also enter Position and Offset value in order to define the position where to find the pattern in the layer 3 protocol message:

> -'*Position'*: choose either 'From Start' or 'From End'. 'From Start' position is the first byte in the layer 3 protocol message, which is the Protocol discriminator.
> -'*Offset'*: define the offset in bytes, regarding the *'Position'* chosen.

Note: **Layer 3 Address (L3Address):** It is used to uniquely reference a user port or a common control function. In case of PSTN user port. This shall be a 15 bit number. In case of an ISDN user port or a common control function, this shall be a 13 bit number. But the *L3Address entered here is always a 16 bit number composed by the 2 bytes which come after the protocol discriminator byte*.

Note: in the 'Bit pattern' area, don't leave blank lines between two bytes of pattern.

Tools -> statistics The statistics function enables the user to view the number of occurrences of any message in Layer1, Layer2 and Layer3 events. Within each window you can apply the statistics count to the monitor, history buffer, or between markers. Analysis can also displayed as a pie chart and applied to any of the protocols such as PSTN, ISDN and BCC protocols running within V5.
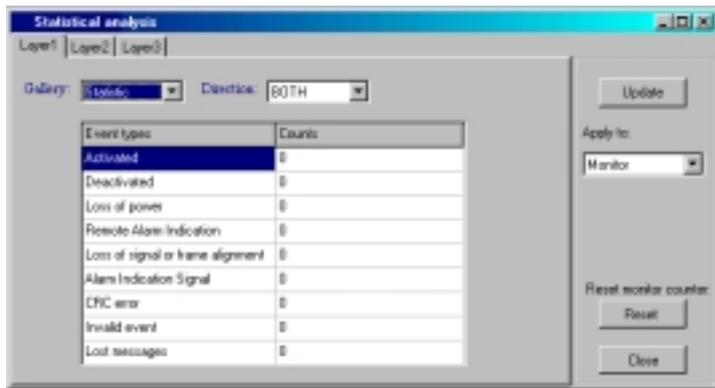
Tools -> Traffic Monitor

The traffic monitor enables the user to view graphically the average, maximum and current rate at which an event is happening.
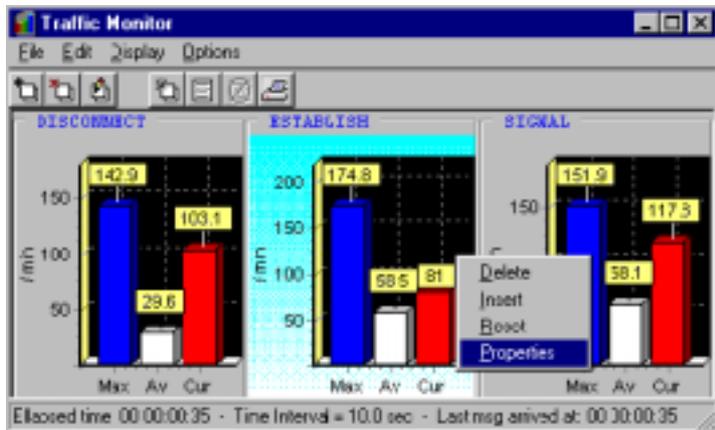
The Traffic monitor has a very intuitive user interface but you can find here some tips about it:

- Add as many charts as you want by choosing "**Add an element**" from the "Edit" menu. For each element, the chart shows the Maximum ("**Max**") throughput, the global Average ("**Av**") throughput since the element has been added, and the current throughput ("**Cur**") which is an average value over a time interval specified by yourself in the element's properties.
- To **select** a particular chart, just left-click it. The information displayed in the **status bar** is relative to the selected chart i.e. the "*Elapsed time*" over which the Average value ("**Av**" bar) is computed, the "*Time Interval*" over which the current value ("**Cur**" bar) is computed, and the time when the *last message* in concern *arrived*.

- Get the **properties** of a particular chart by double clicking on it. The properties are:

  -The chart's **Time Unit**.
  -The **Time Interval**. The instant value (the red bar

in then screenshot) is calculated over this time interval.

- Start the **Journal recording** to save the values as time pass. This will let you create, with Microsoft Excel for instance, a time historical chart.

- Choose "File \ **Exit**" to close the Traffic Monitor, if you DON'T want to continue monitoring the traffic (as a background task); otherwise choose "File \ **Hide**" or click on the upper-right hand icon to close the window.

|	
Setup -> Protocol selection	Protocol selection should be set to V5.1 & V5.2 protocol
Setup -> configuration	This function sets the V5analyser to be configured to a source. It has three function s **1. Server settings** For use with the Emutel windows application the sever settings should be set to local. **2. Capture** This function sets record file and history buffer size. It also enables the user to set the buffer to wrap or stop recording when full. **3. Source** Source will automatically display the current C-channels that are available from the Emutel Virtuoso
Setup -> filters	Filters can be applied to reduce the amount of information displayed to the user. This can be achieved by two methods 1. Suppress/ include selected messages 2. Suppress/include Layer3 address The filters can be applied by selecting the active button on the filter window. The filter can be applied for Layer1,Layer2, and Layer3 messages. The filters can be applied -To an existing trace, **Setup ->filters->display.** -to a record file , **Setup ->filters->record.** -to a history buffer, **Setup ->filters->history buffer**
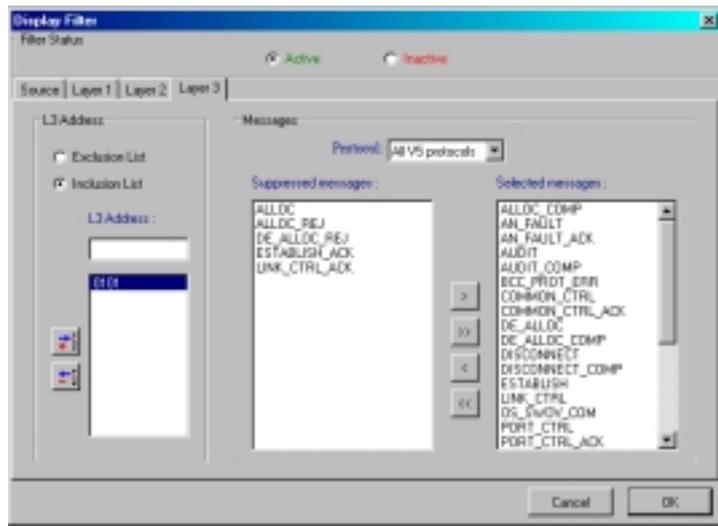
1 Message Filter

Important:
with the V5 protocol using ISDN port, you can have a double layer filter: a filter for V5 protocol messages and L3 address and another for ISDN messages and Call Reference value.

Select the protocol messages to keep or to suppress with the help of the arrow buttons.

Arrow buttons
Use the arrow buttons to move one or more message from one list to the other.
·To move the entire message from one list into the other click the double arrow buttons (>> or <<).
·To move only the selected message or messages from one list into the other, click the single arrow buttons (> or <).

2. L3Address or Call Reference Filter

V5 Protocol: Layer 3 Address (L3Address).
It is used to uniquely reference a user port or a common control function. In case of PSTN user port. This shall be a 15 bit number. In case of an ISDN user port or a common control function, this shall be a 13 bit number. But the L3Address entered here is always a 16 bit number composed by the 2 bytes, which come after the protocol discriminator byte.

Enter the L3Addresses in hexadecimal value and then choose if you want either to exclude or to include only those L3 addresses.

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ISDN Protocol: Call Reference Value.
It is used to identify the call request at the local user-network interface to which the particular message applies. The Call Reference value must be entered in decimal value.

Setup -> Display modes

The display modes function allows the user to set the format of the messages that are displayed in the window. This enables the user to set the decoding for each layer
Layer 1 – ON\OFF or ALARM ONLY
Layer 2 – OFF\HEX\SHORT\COMPLETE
Layer 3 - OFF\HEX\SHORT\Identified\identified + values\COMPLETE

The colors Tag enable the user to change the color combinations of messages. The colors of the messages can be customized to suite the user

Setup -> save setting on exit

This will save any new setting to the setup configuration on exiting the V5analyser

Setup ->save settings now

Saves and setup changes on selection.

Windows -> New

Enables the user to view a current display in another window. This means the user can have a different display method in the second window. Both windows will scroll together. This ensure that both trace decodes are at the same point in the current trace.
Shortcut Key (Ctrl + W)

Help->online help

The online help will enable the user to obtain explanations of the functions shown above. This path may need to be initially set. When selecting the online help function the V5analyser may display an error message in finding the help files. From this error message select browse to find the required files on your computers hard disk.

Help ->V5 protocol guide

The V5 protocol guide help gives the user a general description of the V5 messages defined in ETS 300 324 and ETS 300-347

ISDN INTERFACE PINOUTS

PORT	TELEPHONE NUMBER
V5BRI1	385000
V5BRI2	385020
V5BRI3	385040
V5BRI4	385060
V5BRI5	385080
V5BRI6	385100
V5BRI7	385120
V5BRI8	385140
V5BRI9	385160
V5BRI10	385180
V5BRI11	385200
V5BRI12	385220
V5BRI13	385240
V5BRI14	385260
V5BRI15	385280

PORT	TELEPHONE NUMBER
V5PSTN1	380001
V5PSTN2	380002
V5PSTN3	380003
V5PSTN4	380004
V5PSTN5	380005
V5PSTN6	380006
V5PSTN7	380007
V5PSTN8	380008
V5PSTN9	380009
V5PSTN10	380010
V5PSTN11	380011
V5PSTN12	380012
V5PSTN13	380013
V5PSTN14	380014
V5PSTN15	380015
V5PSTN16	380016
V5PSTN17	380017
V5PSTN18	380018
V5PSTN19	380019
V5PSTN20	380020
V5PSTN21	380021
V5PSTN22	380022
V5PSTN23	380023
V5PSTN24	380024
V5PSTN25	380025
V5PSTN26	380026
V5PSTN27	380027
V5PSTN28	380028
V5PSTN29	380029
V5PSTN30	380030
V5PSTN31	380031
V5PSTN32	380032
V5PSTN33	380033
V5PSTN34	380034
V5PSTN35	380035
V5PSTN36	380036
V5PSTN37	380037
V5PSTN38	380038
V5PSTN39	380039
V5PSTN40	380040
V5PSTN41	380041
V5PSTN42	380042
V5PSTN43	380043
V5PSTN44	380044
V5PSTN45	380045

ISDN INTERFACE PINOUTS

PORT	TELEPHONE NUMBER
V5PSTN47	380047
V5PSTN48	380048
V5PSTN49	380049
V5PSTN50	380050
V5PSTN51	380051
V5PSTN52	380052
V5PSTN53	380053
V5PSTN54	380054
V5PSTN55	380055
V5PSTN56	380056
V5PSTN57	380057
V5PSTN58	380058
V5PSTN59	380059
V5PSTN60	380060

PORT	TELEPHONE NUMBER
V5 EMUTEL BRI1	384700
V5 EMUTEL BRI 2	384720
V5 EMUTEL BRI 3	384740
V5 EMUTEL BRI 4	384760
V5 EMUTEL BRI 5	384780
V5 EMUTEL BRI 6	380800
V5 EMUTEL BRI 7	380820
V5 EMUTEL BRI 8	380840

ISDN interface Pin-outs

The following table shows the pin-outs of the RJ45 connectors for the ISDN interfaces.

	PRI 1	PRI 2	BRI	
	E1 or T1	E1 or T1	S	U
1	R-	T-	NC	NC
2	R+	T+	NC	NC
3	NC	NC	R-	NC
4	T-	R-	T-	RING
5	T+	R+	T+	TIP
6	NC	NC	R+	NC
7	NC	NC	NC	NC
8	NC	NC	NC	NC