Related Documents:


[7] Prolancer Pty Ltd, Total Recall VR LinX Omnia Quick Start Guide, 1.0, 02 September 2013

[8] Prolancer Pty Ltd, Total Recall VR LinX Essence Quick Start Guide, 5.0, 02 September 2013

[9] Prolancer Pty Ltd, Total Recall VR LinX Essence GUI Quick Start Guide, 5.0, 02 September 2013

[10] Prolancer Pty Ltd, Total Recall VR LinX Evolution Quick Start Guide, 3.0, 02 September 2013

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1. Preface

1.1. Conventions

Our guides use several conventions to highlight certain words and phrases and draw attention to specific pieces of information.

1.1.1. Notes & Warnings

We use the following visual styles to draw attention to information that might otherwise be overlooked:

- **Notes** are tips, shortcuts or alternative approaches to the task at hand. Ignoring a note should have no negative consequences, but you might miss out on a trick that makes your life easier.

- **Important boxes** detail things that are easily missed: configuration changes that only apply to the current session, or services that need restarting before an update will apply. Ignoring the information will not cause data loss, but may cause irritation and frustration.

- **Warnings** should not be ignored. Ignoring warnings will most likely cause data loss.

1.1.2. Typographic Conventions

We use typographic conventions to call attention to specific words and phrases. These conventions, and the circumstances they apply to, are as follows.

<table>
<thead>
<tr>
<th>Example</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select <strong>Add</strong> to create a new ...</td>
<td>Locate the button or menu item named &quot;Add&quot; on the screen; navigate to it using the [Up] and [Down] keys and then press the [Select] key to initiate the action.</td>
</tr>
<tr>
<td>Press [Select] ...</td>
<td>Locate the key named “Select” on the control keypad and then press it.</td>
</tr>
<tr>
<td>Enter <strong>Commission</strong> ...</td>
<td>Locate the field named &quot;Commission&quot; on the screen; navigate to it using the [Up] and [Down] keys and then enter</td>
</tr>
<tr>
<td>Choose Country ...</td>
<td>Locate the field named &quot;Country&quot; on the screen; navigate to it using the [Up] and [Down] keys and then repeatedly press the [Select] key to select the desired option.</td>
</tr>
<tr>
<td>-------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Tick Active User ...</td>
<td>Locate the check box named &quot;Active User&quot; on the screen; navigate to it using the [Up] and [Down] keys and then press the [Select] key to place a visual tick in the box.</td>
</tr>
<tr>
<td>Un-tick Active User ...</td>
<td>Locate the check box named &quot;Active User&quot; on the screen; navigate to it using the [Up] and [Down] keys and then press the [Select] key to remove the visual tick in the box.</td>
</tr>
<tr>
<td>Enter 3* ...</td>
<td>Enter &quot;3*&quot; using the keys on the numeric keypad.</td>
</tr>
</tbody>
</table>

### 1.1.3. Procedures

We use numbered sequence of steps to define procedures for performing certain tasks. For example:

**Procedure Title**

1. This is the first step of the procedure.
2. This is the second step of the procedure.
   a. This is the first sub-step of step 2.
   b. This is the second sub-step of step 2.
3. This is step three.

### 1.2. We Need Feedback

If you find a typographical error in this guide, or if you have thought of a way to make this guide better, we would love to hear from you.


If you have a suggestion for improving the guide, then try to be as specific as possible when describing your suggestion. Otherwise, if you have found an error, please include the section number and some of the surrounding text so we can find it easily.
2. **Introduction**

2.1. **About This Guide**

This guide describes the Total Recall VR embedded graphical user interface (embedded GUI) which is available on the following Total Recall VR models:

- Total Recall VR Classic Desktop;
- Total Recall VR Classic Rack;
- Total Recall VR LinX Essence (GUI edition);
- Total Recall VR LinX Evolution (GUI edition); and
- Total Recall VR LinX Omnia.

The guide is intended for Total Recall VR end users. It describes how to use the embedded GUI to monitor recordings in progress, search for and replay recordings, create archives and other functions that end users can perform. In addition, it helps systems and network administrators configure Total Recall VR through the embedded GUI.

Please keep a copy of this guide handy for quick reference.

2.2. **What is Total Recall VR?**

Total Recall VR is a professional audio logging and call recording system which is self-contained, fully featured and cost-effective. Enterprises and governments worldwide use it to create electronic records of many forms of audio communication including telephone, 2-way radio, broadcast radio, public address, room microphones and much more.

Total Recall VR is the ideal solution for:

- Recording business telephone conversations;
- Recording agent calls in contact centres;
- Logging emergency response communication;
- Logging business operations communication;
• Logging radio broadcasts;
• Logging public announcements;
• Creating audio records of meetings, legal proceedings, public enquiries and similar events; and
• Creating compliance records to meet duty of care and legal requirements.

Total Recall VR captures all audio in digital format and stores it in a proprietary, secure and tamper proof file format in its on-board hard drive storage. The file format preserves the originality of the audio that it stores and has a number of built-in mechanisms that aid quick and reliable detection of tampering. However, for ease of access, Total Recall VR client applications can generate copies of recordings in a number of popular and everyday formats such as Microsoft’s Wave (.wav) and MPEG Layer-3 (.mp3).

Storing audio by itself does not help when looking for one recording in a store that can hold hundreds of thousands of recordings. That is why, in addition to audio, Total Recall VR captures and then stores information related to each recording and audio source in its database such as start time, end time and duration of recordings, calling and called numbers on telephone calls, DTMF digits during calls, user configurable notes and much more. This information is the backbone of a powerful search capability which can pin point a single recording in a set of hundreds of thousands of recordings which reside either on the on-board hard drives of a Total Recall VR or in one of many types of off-system archives of recordings.

In addition to the audio recorder and the hard drive storage, each Total Recall VR system comes with a built-in media player with comprehensive player controls (start, stop, fast-forward, rewind …). The player can play audio stored in files directly on the system or stream audio to a remote client application which then outputs the sound to the PC speakers of the PC that it runs on.

While audio recording, storage and re-play are the main functions of Total Recall VR, every Total Recall VR offers many more advanced, professional-grade features. For example:

• Ability to capture audio from different types of audio sources (analogue, VoIP, RoIP, AoIP and ISDN), at the same time – hybrid recording.
• Live and real-time monitoring (listening) of recordings in progress on the system itself or on a remote PC with the aid of a PC client application.
• Feature-rich archiver which can create searchable archives of recordings on CD, DVD or BD discs, USB storage and network drives, either automatically or on-demand.
• Automated self-cleaning mechanism that removes obsolete recordings automatically and on regular intervals to keep the system operating endlessly.
• Automated transcoder which compresses audio to free space on the on-board hard drives.
• SNMP agent capable of generating SNMP alarms (traps).
• SMDR integration for a number of popular PBXes.
• Fully internationalised user interface; all menus and software available in multiple languages.
• Role based access control.
• On-board LCD display and control keypad on selected models.
• A number of PC client applications with unrestricted use license.

When audio records are critical to your operations, Total Recall VR delivers. It is professional, reliable and fully self-contained solution for audio logging and call recording that comes at an affordable price.

The Total Recall VR Overview [1] guide contains a comprehensive description and overview of Total Recall VR.

2.3. Total Recall VR Concepts

2.3.1. Extensions

Total Recall VR Extensions are a Total Recall VR concept and should not be confused with PBX extension numbers which are used for desk phones (or mobile devices) within an enterprise.

Total Recall VR Extensions are one of the three different identifiers that can be assigned to the source and the destination of recordings, irrespective of whether the recordings are of a telephone call or another audio source (such as radio program for example).

The other two identifiers are Total Recall VR Raw and Total Recall VR Mapped Numbers which do not have the same effect as Total Recall VR Extensions to the availability of various features.

As identifiers, Total Recall VR Extensions are fundamental to most Total Recall VR features and if not present for a recording, then most features will not work at all for that recording.

For example, it will not be possible to find recordings by using the ‘Extension’ search criteria.

Total Recall VR can classify calling and called numbers (or PBX extensions) as Total Recall VR Extensions when recording calls. As a matter of fact in most deployments PBX extensions map directly to Total Recall VR Extensions.
However, depending on Total Recall VR configuration, Total Recall VR Extensions can be any free text identifiers. For example, Total Recall VR Extension “Tanya’s Desk Phone” can represent actual PBX extension 100, while “Tanya’s Softphone” can represent (the human form of) PBX extension 200 (which incidentally the PBX may know as “sip:ext200@myenterprise.com”).

Total Recall VR Extensions may (and should) be used on deployments where Total Recall VR is used to record audio sources other than telephone calls. For example Total Recall VR Extensions “2Day FM” can be assigned to recordings created on an analogue recording channel which is used to log the radio program from a radio station called 2Day FM.

Total Recall VR configuration determines Total Recall VR Extensions for recordings. Here is how Total Recall VR uses its configuration to classify identifiers as Total Recall VR Extensions:

1. When recording calls, Total Recall VR extracts the calling and called numbers from call signalling.

   When recording RTP streams, Total Recall VR starts with the <IP address:Tx port> combination as a starting point for the source of the audio identifier and the <IP address:Rx port> combination as a starting point for the destination of the audio identifier.

   When recording other audio sources on analogue recording channels Total Recall VR uses the “Extension” value, which appears in the configuration for each analogue recording channel, as a starting point (as a suggestion of what the extension should be).

   All of the above identifiers are known as Total Recall VR Raw identifiers of the source and destination of recordings.

2. Total Recall VR then converts the Raw identifiers to Total Recall VR Mapped identifiers by applying identifier conversion rules, which are specified in the Signalling Mapping configuration, to each of the Raw identifiers.

   The mapping rules are regular expressions which specify how to convert Raw identifiers to Mapped identifiers. For example, a mapping rule can convert the Raw identifier “sip:ext200@myenterprise.com” to Mapped identifier “Extension 200”.

3. Finally, Total Recall VR attempts to match Mapped identifiers to matching rules that are present in the Internal Dial Plan configuration and if, and only if, it finds a rule that matches a Mapped identifier, then it classifies that identifier as a Total Recall VR Extension.

   Continuing from the previous example, if the Internal Dial Plan configuration has an entry that matches the Mapped identifier “Extension 200”, then, and only then, the identifier “Extension 200” will be classified as a Total Recall VR Extension.
2.3.2. Recording Policies

Recording policies control the operation of the recorder. Policies determine the method of recording which can be:

- Record by default - Total Recall VR will automatically record all audio sources and telephone calls and keep recordings unless instructed otherwise during recording.

- Don’t record by default - Total Recall VR will automatically record all audio sources and telephone calls, but at the end of the recording it automatically discards recordings unless instructed otherwise during recording.

- Record partial calls – Total Recall VR will record only parts of all audio sources and telephone calls, as instructed during recording, and keep all parts concatenated in a single recording.

In addition to the method of recording, policies specify whether real-time monitoring is allowed or not while recording is in progress.

Policies can be one of two types:

- Global – a single system wide policy which applies to recordings from all audio sources and telephone calls on all recording channels.

- Extension – apply only to recordings from audio sources and telephone calls which have been assigned Total Recall VR Extension identifiers. These policies have precedence over the global policy.

Recording policies are useful in a number of ways. For example, policies can be used to:

1. Selectively record (or not) telephone calls to specific telephones.
2. Decide in real-time, while recording, whether to keep a recording of important conversations.
3. Control access to real-time monitoring (listen in) during recording.
4. Allow remote client applications to control (start, stop …) recording.

Total Recall VR Recording Policies depend on Total Recall VR Extension identifiers.

If Total Recall VR cannot determine Extension identifiers, then the recording policies will not work.
3. **On-board Controls**

The following Total Recall VR models feature a built in colour LCD screen and control keypad:

- Total Recall VR Classic Desktop;
- Total Recall VR Classic Rack; and
- Total Recall VR LinX Omnia.

The following Total Recall VR models come with a standalone colour LCD screen and control keypad:

- Total Recall VR LinX Essence (GUI edition)
- Total Recall VR LinX Evolution (GUI edition)

### 3.1. **Colour LCD Screen**

The colour LCD screen is the main display which shows the various screens that are part of the embedded GUI.

The screen has a built in mechanism that extends the life of the screen. The LCD backlight turns off automatically after 5 minutes of inactivity on the control keypad. Total Recall VR continues to operate normally while the LCD backlight is off.

Press any key on the control keypad to turn the LCD backlight on at any time.

### 3.2. **Control Keypad**

The control keypad is a simple and yet powerful input keyboard that is purpose built for the Total Recall VR embedded GUI. All Total Recall VR control keypads have the same keys; however, they come in different shapes and sizes.

The subsequent figure shows the control keypad that is part of the Classic Desktop model.
Rack mount models (Classic Rack and LinX Omnia) have the same keypad as the Classic Desktop model except for the difference in appearance of the Control Keys, which are larger, as shown on the subsequent figure.

Finally, LinX Essence and LinX Evolution models are supplied with a standalone keypad with USB interface as shown on the subsequent figure.
Total Recall VR plays a short “beep” on every key press to acknowledge that it has detected the key press. Every Total Recall VR model provides a volume control button which controls the volume of the “beep”.

### 3.3. Key Functions

Each key on the control keypad has a primary function which may change depending on the current context of the embedded GUI. The primary function is the logical function of the key based on the current context of the GUI. For example, the [▶] key starts playing the selected recording on the Search Screen while the [■] key stops it.

Some keys have a secondary function as well. For example, the [■] key locks the user interface when a recording is not playing.

The following table has a complete summary of key functions:

<table>
<thead>
<tr>
<th>Key</th>
<th>Context</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Menu]</td>
<td>A main screen</td>
<td>Navigates (cycles) between the three main screens: Logging, Search and Options Menu.</td>
</tr>
</tbody>
</table>
| Dialog window|                                | Automatically moves the cursor to either the OK or Cancel button, saving keystrokes.  
<p>|              |                                | Note that it does not actually activate the function that is attached to the button. The [Select] key does this. |
| [Select]     | Button                         | Activates the function attached to the button.                           |
|              | Check box                      | Toggles the state of the check box.                                      |
|              | Input filed                    | Cycles through the set of pre-defined values if the input field has a set of pre-defined values. |
|              | Recording on the Logging Screen| Toggles (start/stop) live real-time monitoring of a recording in progress |</p>
<table>
<thead>
<tr>
<th>Action</th>
<th>Button</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recording on the Search Screen.</td>
<td>Starts replay. Same as pressing the [▶] key.</td>
<td></td>
</tr>
<tr>
<td>Recording list</td>
<td>Moves the screen cursor to the recording before the current one.</td>
<td></td>
</tr>
<tr>
<td>Dialogs</td>
<td>Moves the screen cursor to the previous GUI control or button.</td>
<td></td>
</tr>
<tr>
<td>Recording list</td>
<td>Moves the screen cursor to the recording after the current one.</td>
<td></td>
</tr>
<tr>
<td>Dialogs</td>
<td>Moves the screen cursor to the next GUI control or button.</td>
<td></td>
</tr>
<tr>
<td>Recording on the Search Screen.</td>
<td>Starts re-play.</td>
<td></td>
</tr>
<tr>
<td>Active re-play.</td>
<td>Pauses re-play.</td>
<td></td>
</tr>
<tr>
<td>Active re-play.</td>
<td>Fast forwards.</td>
<td></td>
</tr>
<tr>
<td>Recording on the Search Screen.</td>
<td>Shows the next group of 1000 recordings that are younger (start time) than the group already on the display.</td>
<td></td>
</tr>
<tr>
<td>Active re-play.</td>
<td>Double speed fast forward.</td>
<td></td>
</tr>
<tr>
<td>Active re-play.</td>
<td>Rewinds.</td>
<td></td>
</tr>
<tr>
<td>Recording on the Search Screen.</td>
<td>Shows the next group of 1000 recordings that are older (start time) than the group already on the display.</td>
<td></td>
</tr>
<tr>
<td>Active re-play.</td>
<td>Stops re-play.</td>
<td></td>
</tr>
<tr>
<td>A main screen</td>
<td>Locks the user interface and logs out the current user.</td>
<td></td>
</tr>
<tr>
<td>Entry field</td>
<td>Inputs the digit specified on the key.</td>
<td></td>
</tr>
<tr>
<td>Entry field</td>
<td>Inputs *.</td>
<td></td>
</tr>
<tr>
<td>Recording on the Search Screen.</td>
<td>Tags or un-tags the recording.</td>
<td></td>
</tr>
<tr>
<td>Input field</td>
<td>This key is not used (has no function) on the Classic Desktop and Rack models.</td>
<td></td>
</tr>
<tr>
<td>Input field</td>
<td>On LinX models this key inputs # or clears (deletes) the current value.</td>
<td></td>
</tr>
<tr>
<td>Active re-play.</td>
<td>On LinX models this key activates the “sticky play” mode.</td>
<td></td>
</tr>
</tbody>
</table>
3.4. Using the Control Keypad

The embedded GUI features a cursor (much like a mouse cursor). The [▲] and [▼] keys move the cursor from one item (button, control etc.) on the GUI to another.

When the cursor is positioned on an interactive item (such as a button or a check box), the item becomes highlighted. Various methods are used to indicate that GUI items are currently highlighted.

**Buttons**

Buttons (for example, the **OK** and **Cancel** buttons in a dialog) ‘pop up’ when they are highlighted, and the button text is shown surrounded by a border. For example:

![Standard screen button](image1.png)   ![Highlighted screen button](image2.png)

Use the [Select] key to initiate the action that is attached to the button.

**Lists**

Records in lists are shown **highlighted** when selected. Press the [Select] key to initiate the action associated with the selected record.

**Check Boxes**

Check box text is shown with a **border** around it when selected.

Press the [Select] key to place a check in the check box (referred to in this guide as ‘checking’ the check box).

Data fields associated with check boxes cannot be populated or edited unless the check box is checked.

**Data Entry Fields**

Data fields are shown **highlighted** when selected and can be edited.

Depending on the data filed:

- Use the [Select] key to cycle through available values for data fields with pre-populated options.

- Use the numeric keypad to enter values for input data fields. If you enter the wrong value, simply enter another value and it will overwrite the existing value. Some data fields will clear the current value on the first key press.

3.5. Data Entry

A quick look at the control keypad makes it obvious that data entry is limited to numbers and the ‘*’ and ‘#’ characters. As a result, the embedded GUI uses a number of strategies that make it possible to enter different types of values in data entry fields.
**Data entry fields with pre-defined values**

There are two options to select one of the pre-defined values when the screen cursor is on a field which only accepts pre-defined values.

The first is simply to keep pressing the [Select] key and cycle through the available values until the desired value is shown.

The second is to simply enter the digits that represent the desired value with the numeric keys. For example, it is possible to set the *Session Timeout* in the Session Settings dialog to 2 minutes by pressing the [0] key followed by the [2] key.

![Session Settings](image)

**Data entry fields with no pre-defined value**

To enter a value in a filed which does not have a set of pre-defined values simply enter the value using the numeric keys on the control keypad.

![License Settings](image)

All such fields limit the number of characters that represent a value. As a result, when the limit is reached, the filed simply discards the left-most character and uses the last entry as the right-most character. If you keep pressing digit keys, you will see the value “rotate” from right to left.

For example, the field shown on the previous dialog accepts values that are 4 characters long. So to enter ‘4885’, simply press the following keys in sequence: [4], [8], [8] and [5].

To enter a 2 digit value, say ‘28’ you must use 0 as prefix. The key sequence then is: [0], [0], [2] and [8].

However, some of the fields automatically clear the value on the first key press. If this is the case, then to enter ‘28’ the key sequence reduces to just: [2] and [8].
4. **Main Screens**

The Total Recall VR embedded GUI has 3 main screens:

1. Logging Screen,
2. Search Screen and
3. Options Menu Screen.

Use the [Menu] key to switch from one screen to another as shown on the subsequent figure.

*Figure 4: Embedded GUI Main Screen Flow*

Access to the Options Menu Screen is restricted to Administrator users. This screen is NOT shown to the standard Users.
4.1. Logging Screen

Total Recall VR shows the Logging Screen by default. By default, this screen displays recordings in progress, in reverse start time order (latest, or most recent, on top), as shown on the subsequent figure.

Figure 5: Logging Screen with Recordings in Progress

Starting from the top and moving towards the bottom of the screen:

- Total Recall VR displays the current system date and time at the top of the Logging Screen. This is the time and date that the system uses to time stamp recordings.

- The screen lock indicator also appears on the top of the screen. It can appears as one of the following icons:
  - ːːːː: indicating that a user session is in progress and the system is accepting input and commands from the control keypad.
  - ːːːː: indicating that the screen and keypad are locked and the system is NOT accepting input and commands from the control keypad.

- The table of recordings in progress takes the majority of the space on the screen. This table can contains as many as 120 rows. However, due to limits in screen space, not all rows are shown. Use the [▲] and [▼] keys to scroll through the table. The columns of the table are:
  - **Date**: the date when the recording started.
  - **Time**: the time when the recording started. Total Recall VR uses time stamps with millisecond resolution; however, the time values in this column do not show the millisecond part.
  - **Length**: the current duration of the recorded content. Similar to Time values, Total Recall VR uses millisecond resolution to track duration;
however, the duration values in this column do not show the millisecond part.

- **From:** a Total Recall VR Extension if available, or a Total Recall VR Mapped Number if not, that identifies the source of the audio that is being recorded.

- **To:** a Total Recall VR Extension if available, or a Total Recall VR mapped Number if not, that identifies the destination of the audio that is being recorded.

- **Ch.**: the identifier of the Total Recall VR recording channel that is used for recording. The channel identifier can have one of the following characters as a prefix:
  - `?`: indicates that the recording could not be classified.
  - `<`: indicates that the recording has been classified as ‘incoming’. For example, if the recording is of a telephone call, then the call was an incoming call.
  - `>`: indicates that the recording has been classified as ‘outgoing’. For example, if the recording is of an RTP stream, then the stream is a stream that is generated by an RTP source.
  - `^`: indicates that the recording has been classified as ‘internal’. For example, if the recording is of a telephone call, then the call was an internal call.

- The last column shows a combination of the following indicators:
  - `C`: indicates that recording is in progress.
  - `M`: indicates that real-time live monitoring is in progress.
  - `*`: indicates that the recording has been tagged.

- The recordings indicator appears at the bottom left hand corner of the screen. It shows 3 numbers which are separated by a ‘/’:
  - The first number is the number of the current row in the table of active recordings when navigating through the table with the [▲] and [▼] keys.
  - The second number is the total number of recordings in progress.
  - The third and last number is the total number of completed recordings that exist on the system.

- The disk space occupancy indicator appears on the bottom right hand corner of the screen. It shows the actual used disk space as percent of total available disk space.

As stated earlier, the table of recordings can contain as many as 120 rows, each showing the details of a recording in progress. However, not all 120 rows can appear on the screen at the same time due to limits in screen space. Also, new rows appear and existing rows disappear from the table as new recordings start and current recordings complete.
Use the [▲] and [▼] keys to move the screen cursor to a particular row of the table. The table will highlight the row which has the cursor. At the same time the first number of the recordings indicator (bottom left hand corner of the screen) will change to show the number of the current row in the table. The following figure shows a snapshot of the screen where the screen cursor is on the 4\textsuperscript{th} row of the table.

![Figure 6: Screen Cursor Position on Logging Screen](image)

The position of the screen cursor is important because it identifies the recording in progress for real-time monitoring.

### 4.2. Search Screen

The Search Screen makes provisions for searching, playing and archiving recordings.

By default this screen shows the result of the last search, in reverse start time order (latest on top) as shown on the subsequent figure.
Starting from the top and moving towards the bottom of the screen:

- Total Recall VR displays the current system date and time at the top of the Search Screen. This is the time and date that the system uses to time stamp recordings.

- The screen lock indicator also appears on the top of the screen. It can appear as one of the following icons:
  - : indicating that a user session is in progress and the system is accepting input and commands from the control keypad.
  - : indicating that the screen and keypad is locked and the system is NOT accepting input and commands from the control keypad.

- A set of action buttons appear at the top of the screen:
  - **Search**: initiates a search.
  - **Tag All**: tags all recordings that were identified by the last search.
  - **Archive**: initiates archiving.
  - **Recent Calls**: toggles periodic auto-update of the search result table. When on, the search results table will automatically update on regular intervals to show recently completed recordings.

- The search result table takes the majority of the space on the screen. This table can contain as many as 1000 rows. However, due to limits in screen space, not all rows are shown. Use the [▲] and [▼] keys to scroll through the table. The columns of the table are:
  - **Date**: the date when the recording started.
- **Time**: the time when the recording started. Total Recall VR uses time stamps with millisecond resolution; however, the time values in this column do not show the millisecond part.

- **Length**: the final duration of the recorded content. Similar to Time values, Total Recall VR uses millisecond resolution to track duration; however, the duration values in this column do not show the millisecond part.

- **From**: a Total Recall VR Extension if available, or a Total Recall VR Mapped Number if not, that identifies the source of the audio that is being recorded.

- **To**: a Total Recall VR Extension if available, or a Total Recall VR mapped Number if not, that identifies the destination of the audio that is being recorded.

- **Ch.**: the identifier of the Total Recall VR recording channel that was used for recording. The channel identifier can have one of the following characters as a prefix:
  - ?: indicates that the recording could not be classified.
  - <: indicates that the recording has been classified as ‘incoming’. For example, if the recording is of a telephone call, then the call was an incoming call.
  - >: indicates that the recording has been classified as ‘outgoing’. For example, if the recording is of an RTP stream, then the stream is a stream that is generated by an RTP source.
  - ^: indicates that the recording has been classified as ‘internal’. For example, if the recording is of a telephone call, then the call was an internal call.

- The last column can show a combination of the following indicators:
  - *: indicates that the recording is tagged.
  - A: indicates that the recording has been archived at least once previously.
  - X: indicates that the recording is corrupt, damaged.

- The note display area appears at the bottom of the screen. It shows the full text of notes, if any, that are associated with recordings.

- The search indicator appears at the bottom left hand corner of the screen. It shows 2 numbers which are separated by a ‘/’:
  - The first number is the number of the current row in the table of search results when browsing through the table with the [▲] and [▼] keys.
  - The second number is the total number of recordings that matched the last search criteria.
• The search result display count appears on the bottom right hand corner of the screen. It shows the number of recordings that are actually displayed in the search result table.

As stated earlier, the search result table can contain as many as 1000 rows, each showing the details of a recording. However, not all 1000 rows can appear on the screen at the same time due to limits in screen space.

Use the [▲] and [▼] keys to move the screen cursor to a particular row of the table. The table will highlight the row which has the cursor. At the same time the first number of the search indicator (bottom left hand corner of the screen) will change to show the number of the current row in the table.

The following figure shows a snapshot of the screen where the screen cursor is on the 2nd row of the table.

![Figure 8: Screen Cursor Position on Search Screen](image)

If the search result has more than 1000 recordings, then only 1000 recordings are displayed at a time. Press the [◄] key, when re-play is not in progress, to display older recordings. Similarly, press the [►] key, when re-play is not in progress, to show younger recordings.

### 4.3. Options Menu Screen

The Options Menu Screen makes provisions for system configuration and maintenance. Configuration and maintenance activities are organised in groups, each represented by its own button on this screen.
You must log in as Administrator in order to gain access to this screen. Total Recall VR will not display this screen if you log in as User.

If the User and the Administrator have the same password, Total Recall VR assumes that you log in as the Administrator. By default, both the User and the Administrator have the same password: **0000**.

Buttons on this screen may be disabled (greyed out) if configuration or maintenance activity groups do not apply to your system, as shown on the subsequent figure.
Figure 10: Disabled Options on the Options Menu Screen

Use the [▲] and [▼] keys to move the screen cursor to a particular button on the screen. Then use the [Select] key to access the configuration and maintenance activities associated with the button.
5. **Access Control**

5.1. **Roles**

The embedded GUI has a role based access control mechanism. Two roles exist and one user in each role. The roles are:

1. **Administrator** – the user in this role is allowed to access all functions of the system.

2. **User** – the user in this role is restricted to functions provided by the Logging and Search Screens.

It is not possible to add additional users in any of the roles at this stage.

Total Recall VR decides which user is accessing the system by comparing the password presented by the user at start of a user session with the Administrator and User passwords stored in its configuration. By default, both the User and the Administrator password are the same: 0000.

If the User and the Administrator have the same password, Total Recall VR assumes that you log in as the Administrator.

5.2. **User Sessions**

User sessions are periods of time during which a user interacts with a Total Recall VR through the embedded GUI.

If you are trying to access a Total Recall VR and the LCD screen is blank and dark, press any key on the control keypad to turn the LCD backlight on.

Total Recall VR turns the backlight of the LCD screen off automatically after 5 minutes of inactivity on the control keypad to extend the life of the LCD screen.
Users must enter a password to start a session with a Total Recall VR through the embedded GUI.

**Start a Session with a Total Recall VR**

1. Press any key on the keypad. This will turn the LCD backlight on, if it is off, and display the Enter Password dialog.

2. Enter the Administrator or the User password and then press the [Select] key. By default both passwords are 0000 and by default you will log in as Administrator.

User sessions automatically expire after a configurable time period. By default, this period is 2 minutes of inactivity.

Total Recall VR configuration specifies the timeout period for user sessions. In addition, the same configuration specifies whether sessions time out or not.

Press the [■] key, while not re-playing a recording, to end a user session at any time and on any screen of the embedded GUI.

**5.3. Password Recovery**

If the Administrator password is lost, then it is not possible to recover it from the system via the embedded GUI or any other means.
Keep a record of the administrator and user password in a safe place.

However, it is possible to start a one-time password recovery user session with Total Recall VR if the administrator password is lost.

Use this session to set a new Administrator, and if required User, password.

To start a one-time password recovery user session with Total Recall VR:

**Start a One-time Password Recovery User Session**

1. Press any key on the keypad. This will turn the LCD backlight on, if it is off, and display the Enter Password dialog. Press the [▲] key. This will display the Forgotten Password dialog.
2. This dialog displays a 6 character password recovery code. Note the 6 character code down and e-mail it to us along with the serial number of the unit.

LEAVE THE DIALOG ON THE SCREEN until you receive a **Password** from us. The 6 character code is unique every time you display the dialog while the **Password** that we will send you is only valid for the code that you send us.

3. When you receive a **Password** from us simply start entering it. Do this even if the LCD display is off. The first key that you press will activate the LCD backlight.

4. When done entering the **Password** select **OK** to start a user session.

5. IMMEDIATELY go to the Options Menu Screen and change the administrator, and if required user, password.

### 5.4. Configuration

Total Recall VR configuration for access control comprises of passwords for the two users and user session parameters.

#### 5.4.1. Administrator Password

The default administrator password is 0000. To change the password:

**Change the Administrator Password**

1. Navigate to the Options Menu Screen using the [Menu] key. Select **General Settings** and then select **Administrator Password** to display the Change Password dialog.
2. Enter *New Password*.

3. Enter the same password as *Confirm New Password*.

4. Select OK to record the new password in the system configuration.

### 5.4.2. User Password

The default user password is 0000. To change the password:

**Change the User Password**

1. Navigate to the Options Menu Screen using the [Menu] key. Select General Settings and then select User Password to display the Change Password dialog.

2. Enter *New Password*.

3. Enter the same password as *Confirm New Password*.

4. Select OK to record the new password in the system configuration.

### 5.4.3. User Session Parameters

The user session parameters define what happens to user sessions after a period of inactivity. A period of inactivity is a continuous period of time during which a user does not press any key on the control keypad while a user session is in progress.
By default, user sessions “expire” after a period of inactivity of 2 minutes. The system will automatically end the current user session, lock the control keypad and lock the DVD drive door when a user session “expires”.

User session parameters define the inactivity period as well as whether user sessions “expire” or not.

**Change User Session Parameters**

1. Navigate to the Options Menu Screen using the [Menu] key. Select **General Settings** and then select **User Session** to display the Session Settings dialog.

2. Tick or un-tick **Enable Timeout** to enable or disable session timeout.

3. If you tick **Enable Timeout**, then select an **Idle Timeout** which can be between 1 and 10 minutes (inclusive).

4. Select **OK** to record the new user session parameters in the system configuration.

The new user session parameters take effect immediately. They apply to the current user session as well.
6. Initial Configuration

For best results with Total Recall VR, we recommended that you use the embedded GUI to check and modify some of the system configuration as described in this section BEFORE starting to record calls.

6.1. Display Language

The embedded GUI uses the English language as the default display language. If you are not comfortable with English, then it is possible to change the default display language to another display language which is supported by the embedded GUI.

Change the Display Language

1. Navigate to the Options Menu Screen using the [Menu] key. Select General Settings and then select Language to display the Change Language dialog.

2. Navigate to the button showing the name of the desired language and press the [Select] key.

The embedded GUI will start using the new language as a display language immediately.

6.2. Network Configuration

In most cases Total Recall VR will connect to an enterprise network (a.k.a. enterprise LAN).

The Total Recall VR Classic Desktop and Classic Rack models have a single LAN interface: LAN 1. As a result, this interface must be used for connection to an enterprise...
network. The configuration of the LAN 2 interface on these two models has no impact on the operation of the system.

All other models have two LAN interfaces: LAN 1 and LAN 2. It is recommended to configure the LAN 1 interface for connection to an enterprise network. This leaves the LAN 2 interface to the VoIP packet collector (see the Total Recall VR deployment guide [4] for more details) which is used to record VoIP calls and RTP streams.

The following table shows the default configuration of the two LAN interfaces.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default Value for LAN 1</th>
<th>Default Value for LAN 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP Address</td>
<td>192.168.1.100</td>
<td>192.168.2.100</td>
</tr>
<tr>
<td>Netmask</td>
<td>255.255.255.0</td>
<td>255.255.255.0</td>
</tr>
<tr>
<td>VLAN ID</td>
<td>Not set</td>
<td>Not set</td>
</tr>
</tbody>
</table>

To change the configuration of the LAN 1 or LAN 2 interface:

1. **Change the Configuration of a LAN Interface**
   1. Navigate to the Options Menu Screen using the [Menu] key. Select **Network Settings** to display the Network Settings dialog.

2. This dialog shows a table which lists both the LAN 1 and LAN 2 interface. Navigate to the row that contains the details of the interface that you wish to change and press the [Select] key to display the Network Device Settings dialog.
3. Modify the interface configuration as desired.

4. To clear a value, for example remove VLAN Id, press the [#] key. If the [#] key does not work on your model, then ether 0 as a value.

5. Select OK to record the new parameters in the system configuration.

The change is immediate. The system will apply the new configuration to the LAN interface immediately.

The Network Settings dialog makes provisions to configure other network parameters such as the default gateway and a name server (DNS). Use Total Recall VR Remote Manager to set the hostname.

The following table shows the default configuration.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default Gateway</td>
<td>Not set</td>
</tr>
<tr>
<td>Name Server (DNS)</td>
<td>Not set</td>
</tr>
<tr>
<td>Hostname</td>
<td>Not set</td>
</tr>
</tbody>
</table>

To set a default gateway and a DNS:

**Set Default Gateway and Name Server (DNS)**

1. Navigate to the Options Menu Screen using the [Menu] key. Select Network Settings to display the Network Settings dialog.
2. Modify **Default Gateway** and **Name Server (DNS)** as desired. Note that you do not need to set both.

3. To clear a value, for example remove **Name Server (DNS)**, press the [#] key in all fields of the IP address. If the [#] key does not work on your model, then enter 0 as a value for each field of the IP addresses.

4. Select **OK** to record the new parameters in the system configuration.

The change is immediate. The system will apply the new configuration to the networking layer immediately.

### 6.3. System Time & Date

Total Recall VR has an internal system clock which it uses to time stamp recordings with both UTC time and local time which is based on a configurable time zone.

The internal system clock uses UTC time. This cannot be changed.

However, configuration tells Total Recall VR which time zone to use when time stamping recordings as well as when displaying the system time and recording time stamps. By default Total Recall VR uses the Australian Eastern Standard time zone (Sydney, Australia).

#### Change the System Date and Time

1. Navigate to the Options Menu Screen using the [Menu] key. Select **General Settings** and then select **Date & Time** to display the Date and Time dialog.
2. Set **Date, Time, Time Zone Area** and **Time Zone City** as desired.

3. Select **OK** to set the system date and time to the new values.

   The change is immediate. The system will change its date and time immediately.

   You can change the time zone only if there are no recordings on the system. It is important to set the time zone before you start recording.

As an alternative, Total Recall VR can connect and continually synchronise its internal clock to a single, or a pair of, NTP clock sources.

To connect and continually synchronise the system clock to an NTP source:

1. Make sure that Total Recall VR has a working network connection. See section 6.2 Network Configuration for details on how to configure the network interfaces.

2. Make sure that Total Recall VR can access the NTP server(s) over the network. This may require configuration of the network.
infrastructure such as routers and firewalls.

3. Avoid synchronising with ntp.org servers. Their IP addresses change constantly. As a result, Total Recall VR may not be able to connect to an NTP server reliably.

4. Make sure the NTP servers provide UTC time.

When the configuration specifies two NTP servers, Total Recall VR will synchronise its time with the 1st server. At times when the 1st server is not available, Total Recall VR will switch to the 2nd server. Then, Total Recall VR will switch to the 1st server as soon as the 1st server becomes available.

**Synchronise with NTP Source**

1. Navigate to the Options Menu Screen using the [Menu] key. Select **General Settings** and then select **Date & Time** to display the Date and Time dialog.

2. Tick **Use NTP**.

3. Set **NTP Address 1** to the IP address of the primary NTP server.

4. Optionally, set **NTP Address 2** to the IP address of a secondary NTP server.
DO NOT use the same IP address for both NTP servers. If you only have one NTP server, set **NTP Address 1** only and leave **NTP Address 2** to 0.0.0.0.

5. To clear a value, for example remove **NTP Address 2**, press the [#] key in all fields of the IP address. If the [#] key does not work on your model, then ether 0 as a value for each field of the IP address.

6. Set **Time Zone Area** and **Time Zone City** as desired.

7. Select **OK** to start the NTP client which will connect to the 1\textsuperscript{st} NTP server for the first time.

   If you get an error, then there is a networking problem between the Total Recall VR and the 1\textsuperscript{st} NTP server. You must correct the problem before attempting the configuration again.

The change is immediate. The system will synchronise its date and time to that of the 1\textsuperscript{st} NTP server immediately. This may result in a substantial one-off time shift. Then, the system will continue to synchronise its time with the NTP servers.

### 6.4. License Keys

Total Recall VR uses license keys to control access to certain features of the system. The following keys exist:

1. **Channel Key.** It controls the number of VoIP and ISDN recording channels. Analogue channels do not require a license key because they use a physical hardware which must be installed in the system in order to activate analogue recording channels.

2. **Feature Key.** It controls access to the following features:
   
   a. **Extension Policies,**
   
   b. **Signalling Mapping,**
   
   c. **Internal Dial Plan,**
   
   d. **SMDR Parsing,**
   
   e. **SNMP Alarms,**
   
   f. **Network Archiving and**
   
   g. **RoD Agents.**

A third key, known as Hardware Key, which is unique to every Total Recall VR system, is used to generate the Channel and Feature keys. As a result, the Channel and Feature keys are also unique and cannot be transferred from one Total Recall VR to another.

Both the Channel and Feature key can be either perpetual or time limited. The embedded GUI displays this attribute for each of the keys. Time limited keys automatically deactivate features at the expiry date. As a result, the behaviours of the system will
automatically change on the expiry date; for example, VoIP calls will no longer be recorded or Network Archiving will simply stop working.

Generally, license keys are applied to systems in the factory. However, there are cases when users need to enter new license keys. For example, when changing the number of ISDN or VoIP recording channels, or when replacing any of the electronic components in the system.

The Hardware Key is calculated by Total Recall VR from identifiers associated with various electronic components in the system. If you replace any of the following, then the system will have a new hardware key: motherboard, CPU, disk drive and mid-board.

The new Hardware Key will render the Channel and License keys invalid.

All changes to the license keys start with the Hardware Key. It is not possible to manually change the hardware key; however, it is required to generate new Channel and Feature keys.

**View the Hardware Key**

1. Navigate to the Options Menu Screen using the [Menu] key. Select **License Settings** and then select **Hardware Key** to display the Hardware Key dialog.
The Hardware Key dialog shows the unique Hardware Key as 3 groups of 4 characters. For example: FSFA-RAUB-DAAA on the previous screen capture.

If we ask you to tell us the Hardware Key of your system, then we expect to receive the 3 groups of 4 characters as shown on the Hardware Key dialog on your system from you.

The Channel and Feature license keys comprise of 6 groups of 4 digit numbers. For example: 4885-4895-2552-5555-5558-1828.

When we give you a Channel or a Feature license key, then we will give you 6 groups of 4 digits each for each of the keys. You must enter each group of digits exactly as received from us using the embedded GUI and by following one of the subsequent procedures.

Modify the Channel Key

1. Navigate to the Options Menu Screen using the [Menu] key. Select License Settings and then select VoIP and ISDN License Key to display the Channel Key dialog.
2. Enter each of the 6 groups of 4 digits individually.

Use the [▲] and [▼] keys to move between the entry fields for each of the 4 digit groups. If you make a mistake, simply type the 4 digit group from the beginning.

3. Select OK to record the license key in the system configuration. Note that this step will close the Channel Key dialog. Repeat step 1 to display it again and to view the license information.

The change is immediate. The system will validate the key and if valid it will activate/deactivate recording channels according to the information stored in the key.

**Modify the Feature Key**

1. Navigate to the Options Menu Screen using the [Menu] key. Select **License Settings** and then select **Feature License Key** to display the Feature Key dialog.

2. Enter each of the 6 groups of 4 digits individually.

Use the [▲] and [▼] keys to move between the entry fields for each of the 4 digit groups. If you make a mistake, simply type the 4 digit group from the beginning.

3. Select OK to record the license key in the system configuration. Note that this step will close the Channel Key dialog. Repeat step 1 to display it again and to view the license information.

The change is immediate. The system will validate the key and if valid it will activate/deactivate features according to the information stored in the key.
6.5. Remote Manager Interface

Total Recall VR provides a Java RMI based interface (a.k.a. Remote Manager Interface) that allows client applications, such as Total Recall VR Remote Manager, RoD Client and Supervisor Client, to manage and control it.

This interface depends on a TCP/IP network to connect clients and Total Recall VR systems. The network can be either an enterprise LAN or a dialup link.

Avoid using dialup links. This feature is NOT available on LinX models and will be removed from all other models in near future.

In most cases the network will be an enterprise LAN.

The Total Recall VR Classic Desktop and Classic Rack models have a single LAN interface: LAN 1. As a result, this interface must be used for connection to an enterprise LAN.

All other models have two LAN interfaces: LAN 1 and LAN 2. It is recommended to configure the LAN 1 interface for connection to an enterprise LAN.

See section 6.2 Network Configuration for details on how to configure the network interfaces.

Make sure that Total Recall VR has a working network interface: LAN 1 or LAN 2, before attempting the following Remote Manager Interface configuration.

To configure the Remote Manager Interface to accept client connections over an enterprise LAN:

Configure the Remote Manager Interface for LAN Access

1. Navigate to the Options Menu Screen using the [Menu] key. Select Remote Manager to display the Remote Manager Settings dialog.
2. **Select IP Address.** Choose the IP address that is assigned to the LAN 1 or LAN 2 interface depending on which network you wish to use for client connections.

   You must choose the IP address that is assigned to the LAN 1 interface if your Total Recall VR is a Classic Desktop or Classic Rack model.

3. **Enter Base Port.** Clients need both the IP address and the base port in order to connect to the Total Recall VR.

4. **Set Maximum Sessions** to the maximum number (between 1 and 99) of clients that are allowed to connect at the same time.

   Each client connection requires system resources. The more clients connect at the same time, the less system resources can be dedicated to recording.

5. **Set Session Duration** to the maximum duration (between 30 minutes and 2 hours and 30 minutes in 30 minute increments) of each session. Total Recall VR will automatically end active sessions after this period forcing clients to re-connect if they wish to continue to interact with it.

6. **Select OK** to restart the interface which will start accepting connections from clients on the specified IP address and port.

   The change is immediate. The system will close all active connections from clients, re-start itself and start accepting connections from clients on the specified IP address and port.

   The Remote Manager Interface can accept client connections over a dialup link as well. This is only possible if your Total Recall VR is equipped with a MODEM connector. Note that on some system a USB connector replaces the MODEM connector. If this is
the case, then you cannot configure the Remote Manager Interface to accept connections over a dialup link.

Avoid using dialup links. This feature is NOT available on LinX models and will be removed from all other models in near future.

Make sure that Total Recall VR is connected to a working modem, before attempting the following Remote Manager Interface configuration.

To configure the Remote Manager Interface to accept client connections over a dialup connection:

**Configure the Remote Manager Interface for Dialup Access**

1. Navigate to the Options Menu Screen using the [Menu] key. Select **Remote Manager** to display the Remote Manager Settings dialog.

2. Tick **Use Dial-up**.

   This sets the interface to use IP address 10.0.1.206 and the base port 10010. The two cannot be changed. As a result, clients must be assigned an IP address which is not 10.0.1.206 and is on the 10.0.1.0/24 network. For example: 10.0.1.100.
3. Set **Maximum Sessions** to the maximum number (between 1 and 99) of clients that are allowed to connect at the same time.

   Each client connection requires system resources. The more clients connect at the same time, the less system resources can be dedicated to recording.

4. Set **Session Duration** to the maximum duration (between 30 minutes and 2 hours and 30 minutes in 30 minute increments) of each session. Total Recall VR will automatically end active sessions after this period forcing clients to re-connect if they wish to continue to interact with it.

5. Select **OK** to restart the interface which will start accepting connections from clients on the specified IP address and port.

   Obviously, when using a dialup connection, the configuration of the LAN 1 and LAN 2 interfaces is irrelevant and does not affect the operation of the Remote Manager Interface.

### 6.6. Recorder ID

Every Total Recall VR can be assigned an ID which is a number between 1 and 999 inclusive. The default value of the ID is 1.

If you have only one Total Recall VR, then you can leave the ID set to its default value. You may skip this section.

Total Recall VR uses its ID as a watermark when creating recordings and archives of recordings.

If you have multiple Total Recall VRs, then it is mandatory to assign a different ID to each.

You risk data loss and corrupt archives if you do not.

To change the ID of a Total Recall VR:

**Change the Recorder ID**

1. Navigate to the Options Menu Screen using the [Menu] key. Select **Maintenance** and then select **System Information** to display the System Information dialog.
2. Set **Recorder ID** to a value between 1 and 999 (inclusive).

3. Select **OK** to record the ID in the system configuration.

The change is immediate. Total Recall VR will start using the new ID immediately.
7. Recording

The main and most powerful feature of every Total Recall VR is the audio recorder.

Unlike most audio and telephony recording devices on the market, the recorder is a hybrid channel recorder and as such it is capable of simultaneously recording on multiple recording channels, which can be of different type (analogue, VoIP or ISDN).

The embedded GUI makes provisions for displaying recordings in progress and management of the recorder configuration.

7.1. Recording Storage

Every Total Recall VR system comes with on-board hard drive storage for recordings. The hard drive storage has enough space to store the maximum audio hours as shown in the following table:

<table>
<thead>
<tr>
<th>Encoding</th>
<th>Audio Hours - Max Systems</th>
<th>Audio Hours - LynX Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>HQVQ</td>
<td>190,000</td>
<td>380,000</td>
</tr>
<tr>
<td>SPEEX</td>
<td>120,000</td>
<td>240,000</td>
</tr>
<tr>
<td>G.711</td>
<td>30,000</td>
<td>60,000</td>
</tr>
</tbody>
</table>

In addition Total Recall VR comes with a database for storing additional information for each of the recordings. The database has enough space to store the maximum number of records as shown in the following table:

<table>
<thead>
<tr>
<th>Model</th>
<th>Maximum Records</th>
<th>Low Watermark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classic Desktop</td>
<td>350,000</td>
<td>300,000</td>
</tr>
<tr>
<td>Classic Rack</td>
<td>350,000</td>
<td>300,000</td>
</tr>
<tr>
<td>LinX Omnia</td>
<td>700,000</td>
<td>600,000</td>
</tr>
<tr>
<td>LinX Essence</td>
<td>600,000</td>
<td>500,000</td>
</tr>
<tr>
<td>LinX Essence GUI</td>
<td>500,000</td>
<td>400,000</td>
</tr>
<tr>
<td>LinX Evolution</td>
<td>900,000</td>
<td>700,000</td>
</tr>
<tr>
<td>LinX Evolution GUI</td>
<td>700,000</td>
<td>600,000</td>
</tr>
</tbody>
</table>

To put the limits in perspective, the on-board storage on Classic Rack systems can store 350,000 individual recordings each of 32 minutes and 30 seconds duration, or 175,000 recordings of 65 minutes when using the HQVQ, 8000Hz, 7.9Kbps, mono audio format.
The store has a built-in auto cleaning mechanism which ensures that the system has enough free space in it to continue recording endlessly.

A working archiving strategy must be implemented to avoid losing recordings as a result of auto-cleaning.

In general, the auto-cleaning function automatically deletes recordings when the number of recordings reaches more than the maximum records (see previous table) or the disk occupancy reaches 95% whichever occurs first. It removes oldest first recordings until the number of recordings reduces to the low watermark (see previous table) or less, and the disk occupancy is below 88%.

It is possible to specify the maximum life time of recordings. If this is the case, then the auto-cleaning function may never run as expired recordings are purged from the system on hourly basis.

### 7.2. Recording Interface

Total Recall VR has three different types of audio recording channels:

1. Analogue recording channels, which are capable of capturing audio from different analogue sources and analogue telephone lines.

2. VoIP recording channels, which are capable of detecting, capturing and then processing SIP, H.323 and RTP packets on IP networks.

3. ISDN recording channels, which are capable of capturing and processing signalling and audio on ISDN PRI telephone links.

The Total Recall VR deployment guide [4] contains detailed information and specification for each type of channel.

### 7.3. How to …

Total Recall VR starts recording as soon as it is deployed and its recording channels are activated.

Recordings that are in progress automatically appear on the Logging screen as shown on the subsequent screen capture.

![Logging Screen Showing Recordings in Progress](image)

**Figure 11: Logging Screen Showing Recordings in Progress**

When complete, recordings are removed from this screen. This screen is empty at times when there are no recordings in progress.

Section 4.1 Logging Screen describes the structure and the information that appears on this screen in great detail.

### 7.4. Configuration

The audio recorder has comprehensive configuration options. The embedded GUI makes provision for the management of most of them including:

1. Analogue Settings: analogue recording channel configuration.
2. ISDN Settings: ISDN recording channel configuration.
3. VoIP Settings: VoIP recording channel configuration.
4. Call Settings: general recorder configuration.
5. Extension Settings: global recording policy and extensions recording policies (basic configuration only, some limitations apply)

However, management of some configuration is only possible with the Total Recall VR Remote Manager application. This includes:

1. Extension Settings: extension recording policies (advanced configuration).

4. PBX Integration: SMDR processing configuration.

Total Recall VR uses the Signalling Mapping and Internal Dial Plan configuration to classify numbers, which it detects in signalling messages when recording telephone calls, as Total Recall VR Extensions (see section 2.3.1 Extensions).

Use Total Recall VR Remote Manager to configure Signalling Mapping, Internal Dial Plan and Extension Settings (advanced recording policies).

7.4.1. Analogue Settings
Total Recall VR may be equipped with analogue recording channels, which are capable of capturing audio from different analogue sources and analogue telephone lines.

The default configuration for all analogue recording channels is:

- Recording trigger: VOX level 4, signal level -32dBm (19.5mV).
- Beep tone: disabled (off).
- DTMF tone detection: enabled (on).
- Channel extension: not set.

To change the configuration of the analogue recording channels:

**Configure Analogue Recording Channels**

1. Navigate to the Options Menu Screen using the [Menu] key. Select Analog Settings to display the Channel Settings dialog.
2. Use the [▲] and [▼] key to navigate to the row that shows data for the channel that you wish to change. Press the [Select] key to display the Channel Configuration dialog.

3. To define the type of event that triggers (start/stop) recording on the analogue recording channel, select Trigger.
Select an Off-Hook level if you wish to use DC voltage change as a recording trigger. When a telephone line is connected to the channel, typical on-hook voltage is above 42V and off-hook voltage is below 15V. Recording starts when the DC voltage on the line that is connected to the recording channel becomes lower than the one set by the Off-Hook level. It stops when the DC voltage on the line becomes higher than the set Off-Hook level.

<table>
<thead>
<tr>
<th>Trigger</th>
<th>DC Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off-Hook 1</td>
<td>5V</td>
</tr>
<tr>
<td>Off-Hook 2</td>
<td>10V</td>
</tr>
<tr>
<td>Off-Hook 3</td>
<td>16.5V</td>
</tr>
<tr>
<td>Off-Hook 4</td>
<td>20V</td>
</tr>
<tr>
<td>Off-Hook 5</td>
<td>25V</td>
</tr>
<tr>
<td>Off-Hook 6</td>
<td>30V</td>
</tr>
</tbody>
</table>

Select a VOX level if you wish to use the signal level as a recording trigger. Recording starts when the level of the signal on the line that is connected to the recording channel is above the level set by the VOX level. It stops when the signal level is below the VOX level, but after a user configurable grace period: see VOX Timeout in section 7.4.5 Call Settings.

<table>
<thead>
<tr>
<th>Trigger</th>
<th>Signal Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOX 1</td>
<td>-20dBm (77.5mV)</td>
</tr>
<tr>
<td>VOX 2</td>
<td>-24dBm (48.9mV)</td>
</tr>
<tr>
<td>VOX 3</td>
<td>-28dBm (30.8mV)</td>
</tr>
<tr>
<td>VOX 4</td>
<td>-32dBm (19.5mV)</td>
</tr>
<tr>
<td>VOX 5</td>
<td>-36dBm (12.3mV)</td>
</tr>
<tr>
<td>VOX 6</td>
<td>-40dBm (7.75mV)</td>
</tr>
</tbody>
</table>

Select Manual if you wish to allow third party applications to control recording over the Total Recall VR Java™ RMI API on the channel.

Finally, if you do not connect a signal or telephone line to the recording channel, then select Off.

4. To enable the generation of recording beep (pip tone) select Low (quiet), Medium or High (loud) as value for Beep, otherwise leave it to its default value Off.
If enabled, Total Recall VR will generate a short beep tone every 15 seconds on the line. The tone will be heard by all parties that are connected by the line.

5. Optionally, select Off for **Detect DTMF** to disable DTMF tone detection on the channel.

Total Recall VR detects DTMF tones by default on all recording channels, including the analogue recording channels. However, you may use analogue channels to record analogue signal from sources other than analogue telephone lines. Such sources may not carry DTMF tones, but may contain frequencies that resemble DTMF tones which Total Recall VR will (incorrectly) interpret as DTMF tones.

6. Optionally, enter **Extension**.

The value that you enter with the control keypad can be a combination of digits only. For example: 2001. Use Total Recall VR Remote Manager to enter any free text value. For example: Tanya’s Phone.

To clear the value, press the [+] key. If the [+] key does not work on your model, then use Total Recall VR Remote Manager to clear the value.

Total Recall VR uses this value as a “suggested” Total Recall VR Extension identifier for source of recordings that are captured on the channel. Any number information in the call signalling will override this value when recording calls on analogue telephone lines.

7. Select **Apply** to record the new settings in the configuration. Note that this does not actually apply the new configuration to the recording channel.

Optionally, select **Apply All** to record the same settings for all analogue recording channels.

8. Repeat steps 2 to 7 for other recording channels.

9. Select **OK** when viewing the Channel Settings dialog to actually apply the new configuration to analogue recording channels.

If you change the configuration while recording, then all active recordings on all analogue channels will terminate when you select **OK** on the Channel Settings dialog.

New recordings will start based on the new configuration for the analogue channels.

### 7.4.2. ISDN Settings

Total Recall VR may be equipped with ISDN recording channels, which are capable of capturing signalling and audio on ISDN PRI links.
Use a Channel (license) Key to activate ISDN recording channels, see section 6.4 License Keys.

Unlike analogue channels, it is not possible to configure ISDN recording channels individually. Instead the configuration captures the configuration of the ISDN PRI links that are tapped by Total Recall VR.

ISDN recording channels DO NOT map to B channels on ISDN PRI links. They are allocated dynamically to calls on all ISDN PRI links on first-come, first-served basis.

Total Recall VR can tap both E1 and T1 links. The default configuration for each type of link is:

<table>
<thead>
<tr>
<th></th>
<th>E1 Link</th>
<th>T1 Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line Frame</td>
<td>CRC4</td>
<td>ESF</td>
</tr>
<tr>
<td>Line Code</td>
<td>HDB3</td>
<td>B8ZS</td>
</tr>
<tr>
<td>Protocol</td>
<td>EuroISDN E1</td>
<td>National ISDN 2</td>
</tr>
<tr>
<td>D Channel</td>
<td>16</td>
<td>24</td>
</tr>
<tr>
<td>B Channels</td>
<td>30</td>
<td>23</td>
</tr>
<tr>
<td>Dial Plan</td>
<td>National</td>
<td>National</td>
</tr>
<tr>
<td>Local Dial Plan</td>
<td>National</td>
<td>National</td>
</tr>
<tr>
<td>Country Code</td>
<td>Australia</td>
<td>USA</td>
</tr>
</tbody>
</table>

The configuration for each ISDN link should reflect the configuration for that link on the PBX.

To change the configuration of the ISDN links and recording channels:
**Configure ISDN Links**

1. Navigate to the Options Menu Screen using the [Menu] key. Select **ISDN Settings** to display the ISDN Provider Settings dialog.

2. Use the [▲] and [▼] keys to navigate to the row that shows data for the link that you wish to change. Press the [Select] key to display the ISDN Span Settings dialog.

![ISDN Provider Settings](image)

![ISDN Span Settings](image)
3. Select values for various parameters so that they match the configuration for the ISDN link on the PBX.

4. Optionally, tick **Signalling Tracing**.

   If you enable signalling tracing, then Total Recall VR will write all ISDN signalling messages that it detects on the link in the log. You can examine the logs and view the content of the messages with Total Recall VR Remote Manager.

   This feature is only intended for troubleshooting. DO NOT leave it on during normal operation. It will severely reduce the recording capacity of the system.

5. Select **OK** to record the new settings in the configuration. Note that this does not actually apply the new configuration to the link and recording channels.

6. Repeat steps 2 to 4 for other links.

7. Select **OK** when viewing the ISDN Provider Settings dialog to actually apply the new configuration to the links which will also re-configure the ISDN recording channels.

If you change the configuration while recording, then all active recordings on all ISDN recording channels will terminate when you select **OK** on the ISDN Provider Settings dialog.

New recordings will start based on the new configuration for the ISDN links and channels.

### 7.4.3. VoIP Settings – Max Models

If your Total Recall VR is one of the LinX models, then this section does not apply. See section 7.4.4 VoIP Settings – LinX Models instead.

Total Recall VR may be equipped with VoIP recording channels, which are capable of detecting and collecting SIP, RTP and H.323 packets on IP networks.
Use a Channel (license) Key to activate VoIP recording channels, see section 6.4 License Keys.

Unlike analogue channels, it is not possible to configure VoIP recording channels individually. Instead the configuration captures the configuration of VoIP packet collector which is an integral part of every Total Recall VR.

VoIP recording channels are virtual (ephemeral) channels. They are allocated dynamically to SIP sessions and/or H.323 calls on first-come, first-served basis.

By default, the VoIP packet collector detects SIP sessions on the network that is connected to the LAN 2 interface. It ignores all H.323 calls.

To change the configuration of the VoIP packet collector and recording channels:

**Configure the Local VoIP Packet Collector**

1. Navigate to the Options Menu Screen using the [Menu] key. Select **VoIP Settings** to display the VoIP Provider Settings dialog.
2. Select **Signalling Type**.
   
   There are two options: SIP or H.323. Choose the option that matches the signalling protocol that is used on the network.

3. Leave **Connector Type** set to Local.

4. Select **Connector**. This is the LAN connector which will be used for VoIP call recording.
   
   You must select LAN 1 if your Total Recall VR is a Classic Desktop or Classic Rack.
   
   We recommend you use LAN 2 on all other models for VoIP call recording. This leaves LAN 1 for connection to the enterprise LAN.

5. Select **Limit Calls To**. It specifies the absolute maximum duration of VoIP calls on your network.
   
   Total Recall VR will automatically stop recording VoIP calls when their duration reaches the time specified by this setting. This prevents recording of calls of infinite length if for whatever reason the “end of call” signalling message is not detected by Total Recall VR.

6. Optionally, tick **Signalling Tracing**.
   
   If you enable signalling tracing, then Total Recall VR will write all SIP and H.323 signalling messages that it detects on the network in the log. You can examine the logs and view the content of the messages with Total Recall VR Remote Manager.
   
   This feature is only intended for troubleshooting. DO NOT leave it on during normal operation. It will severely reduce the recording capacity of the system.

7. Select **OK** to record to apply the new configuration to the VoIP packet collector which will also re-configure the VoIP recording channels.

If you change the configuration while recording, then all active recordings on all VoIP recording channels will terminate when you select **OK** on the VoIP Provider Settings dialog.

New recordings will start based on the new configuration for the VoIP packet collector and channels.

If you are using a Total Recall VR Traffic Collector, then you must configure Total Recall VR to accept VoIP packets from the Traffic Collector instead of using the embedded VoIP packet collector.
Traffic Collectors can send packets that they collect from networks using the TCP of UDP protocol. TCP is the recommended protocol as it guarantees the delivery of packets.

**Configure the Remote VoIP Packet Collector**

1. Navigate to the Options Menu Screen using the [Menu] key. Select **VoIP Settings** to display the VoIP Provider Settings dialog.

2. Select **Signalling Type**.
   
   There are two options: SIP or H.323. Choose the option that matches the signalling protocol that is used on the network.

3. Select **Connector Type**. Choose:
   
   - Remote – TCP: (recommended) to use the TCP protocol for packet delivery.
   
   - Remote – UDP: to use the UDP protocol for packet delivery.

4. Enter **TRVR Port**.
   
   This is the TCP or UDP port that Total Recall VR will use to accept connections from Traffic Collectors.

5. Select **TRVR IP Address**.
   
   This is either the IP address that is assigned to the LAN 1 interface or the IP address assigned to the LAN 2 interface.
You must select the IP address that is assigned to the LAN 1 interface if your Total Recall VR is a Classic Desktop or Classic Rack.

We recommend you use the IP address assigned to the LAN 2 interface on all other models for VoIP call recording. This leaves LAN 1 for connection to the enterprise LAN.

6. Select **Limit Calls To**. It specifies the absolute maximum duration of VoIP calls on your network.

   Total Recall VR will automatically stop recording VoIP calls when their duration reaches the time specified by this setting. This prevents recording of calls of infinite length if for whatever reason the “end of call” signalling message is not detected by Total Recall VR.

7. Optionally, tick **Signalling Tracing**.

   If you enable signalling tracing, then Total Recall VR will write all SIP and H.323 signalling messages that it receives from the Traffic Collectors. You can examine the logs and view the content of the messages with Total Recall VR Remote Manager.

   This feature is only intended for troubleshooting. DO NOT leave it on during normal operation. It will severely reduce the recording capacity of the system.

8. Select **OK** to record to apply the new configuration to the VoIP packet collector which will also re-configure the VoIP recording channels.

---

If you change the configuration while recording, then all active recordings on all VoIP recording channels will terminate when you select **OK** on the VoIP Provider Settings dialog.

New recordings will start based on the new configuration for the VoIP packet collector and channels.

---

When Total Recall VR is using 30 or more VoIP recording channels at the same time, i.e. recording 30 or more VoIP calls at the same time, then its performance can improve dramatically if it knows the IP address of SIP server and media gateways that exist on the network.

**Add IP Address of a Call Server**

1. Select **Proxies/Gateways** to display the Manage Call Servers dialog.
2. Select **Add** to add the IP address of a server that is not already on the list. This will display the Add Call Server dialog.

3. Enter the IP address in the 4 fields. Use the [▲] and [▼] keys to navigate between the fields.

4. Select **Add**.

5. Select **OK** in the Manage Call Server dialog.

If you wish to update or remove an IP address for a call server:

**Update IP Address of a Call Server**

1. Select **Proxies/Gateways** to display the Manage Call Servers dialog.
2. Use the [▲] and [▼] keys to navigate to the IP address that you wish to change or remove.

3. Press the [Select] key to display the Update Call Server dialog.

4. To update the IP address, change it and select **Update**.

5. To delete the IP address select **Remove**.

6. Select **OK** in the Manage Call Server dialog.

---

If you change the configuration while recording, then all active recordings on all VoIP recording channels will terminate when you select **OK** on the VoIP Provider Settings dialog.

New recordings will start based on the new configuration for the VoIP packet collector and channels.
7.4.4. VoIP Settings – LinX Models

If your Total Recall VR is one of the Max models, then this section does not apply. See section VoIP Settings – Max Models instead.

Total Recall VR may be equipped with VoIP recording channels, which are capable of detecting and collecting SIP, RTP and H.323 packets on IP networks.

Use a Channel (license) Key to activate VoIP recording channels, see section 6.4 License Keys.

Unlike analogue channels, it is not possible to configure VoIP recording channels individually. Instead the configuration captures the configuration of VoIP packet collector which is an integral part of every Total Recall VR.

VoIP recording channels are virtual (ephemeral) channels. They are allocated dynamically to SIP sessions, H.323 calls and RTP streams on first-come, first-served basis.

By default, the VoIP packet collector detects SIP sessions on the network that is connected to the LAN 2 interface. It ignores all H.323 calls and RTP streams.

7.4.4.1. Packet Collector Settings
To change the configuration of the VoIP packet collector:

Configure the Local VoIP Packet Collector
1. Navigate to the Options Menu Screen using the [Menu] key. Select VoIP Settings to display the VoIP Settings sub-menu.
2. Select **Packet Collector** to display the Packet Collector Settings dialog:

3. Leave **Connector Type** set to Local.

4. Select **Connector**. This is the LAN connector which will be used for VoIP call recording.
We recommend you use LAN 2 on for VoIP call recording. This leaves LAN 1 for connection to the enterprise LAN.

5. Select **OK** to record to apply the new configuration to the VoIP packet collector which will also re-configure the VoIP recording channels.

If you change the configuration while recording, then all active recordings on all VoIP recording channels will terminate when you select **OK** on the Packet Collector Settings dialog.

New recordings will start based on the new configuration for the VoIP packet collector and channels.

If you are using a Total Recall VR Traffic Collector, then you must configure Total Recall VR to accept VoIP packets from the Traffic Collector instead of using the embedded VoIP packet collector.

Traffic Collectors can send packets that they collect from networks using the TCP of UDP protocol. TCP is the recommended protocol as it guarantees the delivery of packets.

**Configure the Remote VoIP Packet Collector**

1. Navigate to the Options Menu Screen using the [Menu] key. Select **VoIP Settings** to display the VoIP Settings sub-menu.
2. Select **Packet Collector** to display the Packet Collector Settings dialog:

![Packet Collector Settings Dialog]

3. Select **Connector Type**. Choose:
   - Remote – TCP: (recommended) to use the TCP protocol for packet delivery.
   - Remote – UDP: to use the UDP protocol for packet delivery.

4. Select **IP Address**.

   This is either the IP address that is assigned to the LAN 1 interface or the IP address assigned to the LAN 2 interface.

   We recommend you use the IP address assigned to the LAN 2 interface for VoIP recording. This leaves LAN 1 for connection to the enterprise LAN.

5. Enter **Port**.

   This is the TCP or UDP port that Total Recall VR will use to accept connections from Traffic Collectors.

6. Select **OK** to record to apply the new configuration to the VoIP packet collector which will also re-configure the VoIP recording channels.

![Warning]

If you change the configuration while recording, then all active recordings on all VoIP recording channels will terminate when you select **OK** on the Packet Collector Settings dialog.

New recordings will start based on the new configuration for the
VoIP packet collector and channels.

7.4.4.2. VoIP Calls Settings

By default, Total Recall VR records SIP sessions (calls). To change the configuration for VoIP call recording:

**Configure VoIP Call Recording**

1. Navigate to the Options Menu Screen using the [Menu] key. Select **VoIP Settings** to display the VoIP Settings sub-menu.

2. Select **VoIP Calls** to display the VoIP Calls Settings dialog:
3. Select **Signalling Type**.

   There are two options: SIP or H.323. Choose the option that matches the signalling protocol that is used on the network.

4. Optionally, tick **Signalling Tracing**.

   If you enable signalling tracing, then Total Recall VR will write all SIP and H.323 signalling messages that it receives in its logs. You can examine the logs and view the content of the messages with Total Recall VR Remote Manager.

   This feature is only intended for troubleshooting. DO NOT leave it on during normal operation. It will severely reduce the recording capacity of the system.

5. Select **OK** to record to apply the new configuration to the VoIP packet collector which will also re-configure the VoIP recording channels.

   If you change the configuration while recording, then all active recordings on all VoIP recording channels will terminate when you select **OK** on the VoIP Call Settings dialog.

   New recordings will start based on the new configuration.
7.4.4.3. RTP Streams Settings
Total Recall VR uses SIP and H.323 signalling to determine the source and destination of RTP streams when recording VoIP calls. However, in RoIP and AoIP applications, where signalling is not available, Total Recall VR can record RTP streams as instructed by its configuration.

To add an RTP stream to the configuration:

**Add RTP Stream(s)**

1. Navigate to the Options Menu Screen using the [Menu] key. Select VoIP Settings to display the VoIP Settings sub-menu.

2. Select RTP Streams to display the table of RTP Endpoint Settings:
3. Select **Add** to display the RTP Endpoint Settings dialog:

4. Enter **IP Address**.

   This is the IP address of the network element (endpoint) where the RTP stream originates and/or terminates.
5. Optionally, if you wish to record the RTP streams that originate from this endpoint, enter **Tx Port**.

   Note: you must enter a Tx or an Rx port, or both. If you enter only a Tx port, then Total Recall VR will record all RTP streams that are sent by the endpoint with the specified IP address on the specified Tx port.

   If you wish to record multicast RTP streams, then enter only a Tx port and leave the Rx port blank. For example, to record a multicast stream sent to IP address 224.0.0.1 and port 4400, enter 224.0.0.1 as **IP Address** and 4400 as **Tx Port**.

   Use the Remote Manager application to enter a regular expression which matches a range of ports. For example, 700[0-9] which will instruct Total Recall VR to record all RTP streams that originate from this endpoint on ports 7000 to 7009 inclusive.

6. Optionally, if you wish to record the RTP streams that terminate at this endpoint, enter **Rx Port**.

   Note: you must enter a Tx or an Rx port, or both. If you enter only a Rx port, then Total Recall VR will record all RTP streams that are received by the endpoint with the specified IP address on the specified Rx port.

   Use the Remote Manager application to enter a regular expression which matches a range of ports. For example, 700[0-9] which will instruct Total Recall VR to record all RTP streams that terminate at this endpoint on ports 7000 to 7009 inclusive.

7. Select **VOX Timeout**.

   This parameter defines the period of ‘quiet time’ (absence of RTP packets) during recording which must pass before Total Recall VR stops recording the RTP stream.

8. Optionally, enter **Events Payload** if you wish to collect RFC 2833 named and tone events that are sent in composite RFC 2833 messages. Otherwise leave this field blank.

   The value of **Events Payload** should match the payload ID that appears in RTP packets that carry composite RFC 2833 messages.

   Note: In most cases **Events Payload** will be blank as RFC 2833 messages that carry multiple named and/or tone events are rarely implemented.

9. Optionally, enter **Named Event Payload** if you wish to collect RFC 2833 named events (for example DTMF digits) that are sent in RFC 2833 messages. Otherwise leave this field blank.

   The value of **Named Event Payload** should match the payload ID that appears in RTP packets that carry named RFC 2833 messages.

10. Optionally, enter **Tone Event Payload** if you wish to collect RFC 2833 tone events that are sent in RFC 2833 messages. Otherwise leave this field blank.
The value of *Tone Event Payload* should match the payload ID that appears in RTP packets that carry tone RFC 2833 messages.

11. Select **Ok** to return to the table of RTP Endpoint Settings where you must select **Ok** to apply the settings.

If you change the configuration while recording, then all active recordings on all VoIP recording channels will terminate when you select **OK**.

New recordings will start based on the new configuration.

To change the configuration for an RTP endpoint or remove it from the list of endpoints that are being recorded:

**Manage RTP Stream(s)**

1. Navigate to the Options Menu Screen using the [Menu] key. Select **VoIP Settings** to display the VoIP Settings sub-menu.

2. Select **RTP Streams** to display the table of RTP Endpoint Settings:
3. Use the [▲] and [▼] keys to navigate to the record that you wish to change or remove, then press the [Select] key to display the RTP Endpoint Settings dialog:

4. If you wish to remove the record, use the [▲] and [▼] keys to navigate to the Remove button and then select Remove. Otherwise:

5. Change IP Address.
This is the IP address of the network element (endpoint) where the RTP stream originates and/or terminates.

6. Optionally, if you wish to record the RTP streams that originate from this endpoint, change \textit{Tx Port}.

Note: you must enter a Tx or an Rx port, or both. If you enter only a Tx port, then Total Recall VR will record all RTP streams that are sent by the endpoint with the specified IP address on the specified Tx port.

If you wish to record multicast RTP streams, then enter only a Tx port and leave the Rx port blank. For example, to record a multicast stream sent to IP address 224.0.0.1 and port 4400, enter 224.0.0.1 as \textit{IP Address} and 4400 as \textit{Tx Port}.

Use the Remote Manager application to enter a regular expression which matches a range of ports. For example, 700[0-9] which will instruct Total Recall VR to record all RTP streams that originate from this endpoint on ports 7000 to 7009 inclusive.

7. Optionally, if you wish to record the RTP streams that terminate at this endpoint, change \textit{Rx Port}.

Note: you must enter a Tx or an Rx port, or both. If you enter only a Rx port, then Total Recall VR will record all RTP streams that are received by the endpoint with the specified IP address on the specified Rx port.

Use the Remote Manager application to enter a regular expression which matches a range of ports. For example, 700[0-9] which will instruct Total Recall VR to record all RTP streams that terminate at this endpoint on ports 7000 to 7009 inclusive.

8. Select \textit{VOX Timeout}.

This parameter defines the period of ‘quiet time’ (absence of RTP packets) during recording which must pass before Total Recall VR stops recording the RTP stream.

9. Optionally, change \textit{Events Payload} if you wish to collect RFC 2833 named and tone events that are sent in composite RFC 2833 messages. Otherwise leave this field blank.

The value of \textit{Events Payload} should match the payload ID that appears in RTP packets that carry composite RFC 2833 messages.

Note: In most cases \textit{Events Payload} will be blank as RFC 2833 messages that carry multiple named and/or tone events are rarely implemented.

10. Optionally, change \textit{Named Event Payload} if you wish to collect RFC 2833 named events (for example DTMF digits) that are sent in RFC 2833 messages. Otherwise leave this field blank.

The value of \textit{Named Event Payload} should match the payload ID that appears in RTP packets that carry named RFC 2833 messages.
11. Optionally, change **Tone Event Payload** if you wish to collect RFC 2833 tone events that are sent in RFC 2833 messages. Otherwise leave this field blank.

The value of **Tone Event Payload** should match the payload ID that appears in RTP packets that carry tone RFC 2833 messages.

12. Select **Ok** to return to the table of RTP Endpoint Settings where you must select **Ok** to apply the settings.

---

If you change the configuration while recording, then all active recordings on all VoIP recording channels will terminate when you select **OK**.

New recordings will start based on the new configuration.

---

### 7.4.5. Call Settings
This is a group of general recording configuration parameters.

**Update Call Settings**

1. Navigate to the Options Menu Screen using the [Menu] key. Select **Call Settings** to display the Call Settings dialog.
2. Tick **Disable Compression** if you wish to disable compression of VoIP and ISDN call recordings.

   Total Recall VR automatically compresses recordings of VoIP and ISDN calls to the **SPEEX Q8, 8000Hz, 15Kbps, mono** format. This flag, if selected, instruct Total Recall VR to keep recordings of VoIP and ISDN calls in the **G.711 A-law, 8000Hz, 64Kbps, mono** or **G.711 μ-law, 8000Hz, 64Kbps, mono** format.

   This setting has no effect on recordings created on analogue recording channels which are automatically compressed to the **HQVQ, 8000Hz, 7.9Kbps, mono** format.

3. Select **Min. Call Length**.

   Total Recall VR automatically discards recordings that are shorter than the duration specified by this parameter. A special value, Ignore, instruct Total Recall VR to keep all recordings irrespective of their length.

   This parameter is useful if you wish to eliminate short phantom recordings which are created by noise on the line when recording analogue sources and using VOX (signal level) as a recording trigger.

4. Select **Max. Call Length**.

   Total Recall VR can create recordings of virtually any duration. However, this creates problems with file sizes. To avoid problems with file sizes, Total Recall VR automatically rolls over recordings to another file when recordings reach the duration specified by this parameter.

   Recordings that are rolled over are marked with “(cont)”.

5. Select **Max. Call Lifetime**.

   Total Recall VR automatically discards (deletes) old recordings when the disk becomes full to free space for new recordings. This ensures continuous operation.

   This parameter, when set to value other than Ignore, tells Total Recall VR the age of recordings that can be safely removed from the system even if the disk is not full.

6. Select **VOX Timeout**.

   At this stage the value of this parameter applies only to analogue recording channels that use VOX level as recording trigger.

   This parameter defines the period of ‘quiet time’ (absence of signal at level above the level set for the analogue channel) during recording which must pass before Total Recall VR stops recording on the channel.

7. Optionally, tick **Recording Period** if you wish to record only between certain times. Set the start and stop time as well.

8. Select **OK** to save and apply the settings.
If you change the \textit{VOX Timeout} while recording, then all active recordings on all analogue recording channels will terminate when you select \textbf{OK}.

New recordings will start based on the new configuration for the analogue recording channels.

If an analogue recording channel has \textit{Trigger} set to a VOX level:

1. The interval between calls must exceed the value of \textit{VOX Timeout}. If a new call starts within the timeout on the same channel, then Total Recall VR assumes it is the continuation of the current recording which is in progress. The audio of both calls will appear in the same recording.

2. If a call is put on hold without music on hold, then recording will terminate after the period specified by \textit{VOX Timeout}. Total Recall VR will start a new recording when the call recommences.

\section*{7.4.6. Signalling Mapping}

Use Total Recall VR Remote Manager.

\section*{7.4.7. Internal Dial Plan}

Use Total Recall VR Remote Manager.
7.4.8. PBX Interface

Use Total Recall VR Remote Manager.

7.4.9. Extension Settings

Recording policies control the operation of the recorder and determine the record of recording.

As section 2.3.2 Recording Policies explains, policies can be one of two types:

- Global – a single system wide policy which applies to recordings from all audio sources and telephone calls on all recording channels.
- Extension – apply only to recordings from audio sources and telephone calls which have been assigned Total Recall VR Extension identifiers. These policies have precedence over the global policy.

The default global policy is:

- All audio sources and telephone calls are recorded and recordings are kept unless instructed otherwise during recording.
- Real time monitoring of recordings in progress is allowed.
- The use of DTMF key sequences to control recording is disallowed when recording telephone calls.

To change the default global recording policy:

**Change the Global Recording Policy**

1. Navigate to the Options Menu Screen using the [Menu] key. Select **Extension Settings** to display the Extension Settings dialog.
2. To enable or disable real-time monitoring of recordings in progress, tick or un-tick *Enable Monitoring*.

3. Select *Recording Mode*.

The value of *Recording Mode* determines the method of recording which can be:

- Record by Default: Total Recall VR will automatically record all audio sources and telephone calls and keep recordings unless instructed otherwise during recording.

- Don’t Record by Default: Total Recall VR will automatically record all audio sources and telephone calls, but at the end of the recording it automatically discards recordings unless instructed otherwise during recording.

- Add Notes Only: Total Recall VR will automatically record all audio sources and telephone calls. Parties on calls cannot use DTMF key sequences to instruct Total Recall VR to discard or keep recordings - recordings are always kept. Same applies to applications which use the Remote Manager Interface to control recording. However, such applications can add notes to recordings in progress.

- Record Partial Calls: Total Recall VR will record only parts of all audio sources and telephone calls, as instructed during recording, and keep all parts concatenated in a single recording.

- Disallowed: Total Recall VR will automatically record all audio sources and telephone calls. Parties on calls cannot use DTMF key sequences to instruct Total Recall VR to discard or keep recordings -
recordings are always kept. Same applies to applications which use the Remote Manager Interface to control recording. In addition, applications cannot add notes to recordings in progress.

4. To enable or disable control of recording via DTMF key sequences, tick or un-tick Enable Phone Keys.

5. If you tick Enable Phone Keys, then set:
   a. Start Recording Phone Key to the DTMF key sequence that will start recording. The sequence can be up to 3 digits long.
   b. Stop Recording Phone Key to the DTMF key sequence that will stop recording. The sequence can be up to 3 digits long.

6. Select OK to store the policy in the system’s configuration.

The change is immediate. Total Recall VR will start using the new default policy from the next recording. All recordings that are already in progress will not be affected; however, the previous default policy applies to them.

There are no extension based policies by default. To add a new extension based policy:

**Add a Recording Policy for an Extension**

1. Navigate to the Options Menu Screen using the [Menu] key. Select Extension Settings to display the Extension Settings dialog.

2. Select Add to display the Extension Settings dialog for an extension policy.
3. Enter **Extension**. This MUST be a Total Recall VR Extension as determined by Total Recall VR. Section 2.3.1 Extensions describes the process in detail. Use Total Recall VR Remote Manager to enter a regular expression which will match a number of extensions.

4. To enable or disable real-time monitoring of recordings in progress, tick or un-tick **Enable Monitoring**.

5. Select **Recording Mode**.

6. To enable or disable control of recording via DTMF key sequences, tick or un-tick **Enable Phone Keys**.

7. If you tick **Enable Phone Keys**, then set:
   a. **Start Recording Phone Key** to the DTMF key sequence that will start recording. The sequence can be up to 3 digits long.
   b. **Stop Recording Phone Key** to the DTMF key sequence that will stop recording. The sequence can be up to 3 digits long.

8. Select **OK** to add the policy to existing set of extension recording policies.

9. Repeat steps 2 to 8 to add additional extension recording policies.

10. Select **OK** to store the new policies in the system’s configuration.

The change is immediate. Total Recall VR will start using the new extension recording policies from the next recording. All recordings that are already in progress will not be affected; however, the previous default or extension policies apply to them.

To edit or remove an existing extension recording policy:
Manage a Recording Policy for an Extension

1. Navigate to the Options Menu Screen using the [Menu] key. Select 
   Extension Settings to display the Extension Settings dialog. Use the [▲] and [▼] keys to navigate to the policy that you wish to manage.

2. Press the [Select] key to the Extension Settings dialog for an extension policy.
3. Update the parameters as desired and select **OK**.

4. Or, simply select **Remove**, to remove the policy from the current set of extension recording policies.

5. Repeat steps 2 to 4 to manage additional extension recording policies.

6. Select **OK** to store the updates in the system’s configuration.

The change is immediate. Total Recall VR will start using the updated extension recording policies from the next recording. All recordings that are already in progress will not be affected; however, the previous default or extension policies (even if removed) apply to them.

Note that Total Recall VR can assign two Total Recall VR Extensions to a recording; one as an identifier for the source of the recording (the calling party on a call for example) and another as an identifier for the destination of the recording (the called party on a call for example).

Conflicts between extension policies are likely in such cases. Total Recall VR deals with conflicting extension recording policies as follows:

- The settings of the policy with **Recording Mode** set to OTHER THAN ‘Record Partial Calls’ takes precedence over the settings for the extension policy with **Recording Mode** set to ‘Record Partial Calls’.

For example: if extension policy A is set to ‘Record by Default’ with monitoring disabled, while extension policy B is set to ‘Record Partial Calls’ with monitoring enabled, then policy A will apply to the recording – everything will be recorded and monitoring will not be allowed.
• If *Recording Mode* is identical, then the policy which allows monitoring takes precedence.

For example: if extension policy A is set to ‘Record by Default’ with monitoring disabled, while extension policy B is set to ‘Record by Default’ with monitoring enabled, then policy B will apply to the recording - everything will be recorded and monitoring will be allowed.

If anyone in your organisation specifically does not want any of their calls to be monitored, they must be made aware of how Total Recall VR deals with conflicting extension recording policies.
8. Monitoring

Total Recall VR is capable of playing audio that it records while recording and in real-time (as it happens).

8.1. Monitoring Interface – Classic Models

The real-time monitoring interface on the Total Recall VR Classic models comprises of:

- Built in audio amplifier and 2W speaker.
- Headphone jack. This is a standard three conductor, 3.5mm, stereo audio jack for connection of headphones or external speaker.
- Line output jack. This is a standard three conductor, 3.5mm, stereo audio jack for connection of an external recorder or a line input of a PC or amplifier.
- Volume control thumb wheel.

For further information on the monitoring interface see the quick start guide for the Classic Desktop [5] and the Classic Rack [6].

8.2. Monitoring Interface – LinX Omnia

The real-time monitoring interface on the Total Recall VR LinX Omnia model comprises of:

- Built in audio amplifier and 2W speaker.
- Headphone jack. This is a standard three conductor, 3.5mm, stereo audio jack for connection of headphones or external speaker.
- Line output jack. This is a standard three conductor, 3.5mm, stereo audio jack for connection of an external recorder or a line input of a PC or amplifier.
- Volume control thumb wheel.

For further information on the monitoring interface see the quick start guide for the Max Rack [7].

8.3. Monitoring Interface – Other LinX Models

The real-time monitoring interface on the Total Recall VR LinX models other than LinX Omnia comprises of optional speakers or headphones that are connected to the LINE OUT output that is available on the processing unit.

Speakers and/or headphones are not supplied with your Total Recall VR. We recommend you invest in a quality stereo speakers or headphones.

Any speakers or headphones that work with your PC will work with your Total Recall VR.
As an alternative, you can use the mono speaker that is part of the colour LCD screen.

For further information on the monitoring interface and how to use the mono speaker that is part of the LCD screen see the quick start guide for the LinX Essence [9] and the LinX Evolution [11].

8.4. How to …

To monitor recordings in progress, in real time, first navigate to the Logging Screen with the [Menu] key. Then, to listen to the audio as it is being recorded:

**Monitor Recording in Progress**

1. Navigate to the row that shows the details of the recording that you wish to listen to. Use the [▲] and [▼] keys to navigate to the correct row.

2. Press the [Select] key to start monitoring.

The following will happen when you start monitoring:

- The row that shows the details of the recording will move to top of the table from its sort position according to start time and it will remain highlight.

- “[Monitoring]” will appear at the centre bottom of the Logging screen.

- Audio will be heard from the built-in speaker, or head phones if connected.

![Logging Screen](image-url)
3. Press the [Select] key to stop monitoring.

Monitoring automatically stops when you try and navigate with the [▲] and [▼] keys while monitoring is in progress as well.

The following will happen when you stop monitoring:

- The row that shows the details of the recording will move from the top of the table to its sort position according to the start time.

  It may be hard to track where in the table the row moves to when there are lots of recordings on the screen and you stop monitoring. If you are looking for the same recording after you stop monitoring, then remember that recordings are shown sorted on the Logging screen. The recordings are sorted in start time reverse order – most recent start time at the top of the table.

- “[Monitoring]” will disappear from the centre bottom of the Logging screen.

- Audio will cease.

4. Repeat steps 2 to 3 to monitor other recordings in progress.

Total Recall VR remembers the channel number of the recording channel when you start monitoring, but not stop it while recording is in progress. And if a new recording starts on the same channel, Total Recall VR automatically start monitoring the new recording.

This is not useful for recordings on VoIP and ISDN recording channels as these recording channels are allocated dynamically to recordings. However, it may prove very useful for recordings on analogue channels where one-to-one mapping exists between audio sources and recording channels.

For example, if you start monitoring a recording in progress that is using analogue recording channel 1, and not stop it while it is in progress, then monitoring continues when the next recording starts on analogue recording channel 1.

8.5. Configuration

8.5.1. Monitoring

Total Recall VR does not have any configuration specific to monitoring.

However, the global recording policy and extension recording policies specify whether monitoring is allowed or not, globally or for specific extensions.

Section 7.4.9 Extension Settings contains details on how to configure the global recording policy and extension specific recording policies.
9. Searching

Total Recall VR stores additional information for each recording along with the recording. This information includes:

1. Start and end date and time of recordings.
2. Duration of recordings.
3. Total Recall VR Raw, Mapped and Extension identifiers for the source and destination of recordings (for example calling and called numbers for recordings of calls) – see section 2.3.1 Extensions for further details on these identifiers.
4. DTMF digits that are detected while recording.
5. Free-text notes.
6. Classification of telephone calls (incoming, outgoing, internal or unknown).
7. Flags which indicate whether recordings have been archived in the past or tagged for future operations.
8. Recording channel number.
9. Agent name.

This information is the backbone of a comprehensive search function which can locate individual recordings based on a number of criteria such as:

- Date and time of recording.
- Total Recall VR Raw, Mapped and Extension identifiers.
- Duration of recording.
- Call classification.
- DTMF digits.
- Keyword(s) in notes.
- Flags: archived and tagged recordings.

The embedded GUI makes provisions for searching for recordings that reside on the system itself, recordings that are stored on an archive disc (CD, DVD or BD), recordings that are stored on a USB key or disk drive, or recordings that are stored in a pre-defined network archive.

USB key/disk search is available on Total Recall VR Classic Desktop and Rack only if fitted with a USB connector instead of a MODEM connector.
When using the embedded GUI, search criteria are limited to the following parameters:

- Start date and time of recording.
- Total Recall VR Raw, Mapped and Extension identifiers.
- Call classification.
- Flags: tagged recordings.

Use Total Recall VR Remote Manager if you wish to use the extended set of search parameters to define search criteria.

9.1. How to …

To locate recordings that have completed first navigate to the Search Screen with the [Menu] key. Then, to find recordings that reside on the system:

**Search for Recordings**

1. Select **Search …** to display the Search Criterion dialog.

2. Tick and enter values for **Date, Time, Number** etc., in any combination, to include parameters in the criterion that will be used in the search. Only recordings that match the criterion will be selected by the search.

   If you do not include any of the parameters in the criterion, then the criterion will match all recordings.

3. Select **Search** to search recordings that reside on the system itself. The search will identify all recordings that match the search criterion and display them. For example:
The table will be empty if no recordings match the search criterion.

Note that the recordings are displayed sorted in reverse order of start time, i.e. latest recording on top.

4. If the search results in 1000 recordings or less, then all recordings will be shown. However, due to screen space limits, only 25 or so will be visible. Use the [▲] and [▼] keys to view rows that are not visible.

If you locate recordings that are important to you, then you can tag them by pressing the [*] key when the screen cursor is on the rows that represent the recordings. Later, you can use the Tag parameter to create a criterion that identifies the recordings that you tag.

As you navigate the table, notes associated with recordings will be shown in the notes area of the screen. For example:

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Length</th>
<th>From</th>
<th>To</th>
<th>Ch.</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 Sep 2012</td>
<td>10:29:50</td>
<td>00:01:06</td>
<td>5141221333</td>
<td>2139</td>
<td>&gt; 29</td>
</tr>
<tr>
<td>18 Sep 2012</td>
<td>10:29:27</td>
<td>00:01:09</td>
<td>2001</td>
<td>2006</td>
<td>&lt; 27</td>
</tr>
<tr>
<td>18 Sep 2012</td>
<td>10:27:10</td>
<td>00:03:16</td>
<td>2039</td>
<td>12000790000</td>
<td>&lt; 63</td>
</tr>
<tr>
<td>18 Sep 2012</td>
<td>10:27:04</td>
<td>00:03:40</td>
<td>Emil</td>
<td>2077</td>
<td>&lt; 25</td>
</tr>
</tbody>
</table>
5. If the search results in more than 1000 recordings, then the screen will display recordings in groups of 1000. Press the [] key when re-play is not in progress to display older recordings. Similarly, press the [] key when re-play is not in progress to show younger recordings.

6. To perform another search, start from step 1.

Search for recordings in an archive is similar, except you need to specify the type of the archive that you wish to search:

**Search for Recordings in an Archive**

1. Select **Search …** to display the Search Criterion dialog.
2. Tick and enter values for *Date, Time, Number* etc., in any combination, to include parameters in the criterion that will be used in the search. Only recordings that match the criterion will be selected by the search. If you do not include any of the parameters in the criterion, then the criterion will match all recordings.

3. Select **Search Archive** to display the Search Archive dialog.
4. Select **Archive Device**:

   a. Select Disc if you wish to search for recordings that are stored in a Total Recall VR archive that is located on a CD, DVD or BD disc.

   ![Search Archive](image)

   Enter a CD, DVD or BD disc into the system drive.

   b. Skip to step 5 or, select USB if you wish to search for recordings that are stored Total Recall VR archive that is located on a USB key.

   ![Search Archive](image)

   Attach a USB key to the system. Note that the system will take few seconds to recognise the USB key and prepare to access it.

   c. Skip to step 5 or, select Network Share if you wish to search for recordings that are stored in a Total Recall VR archive that is located on a network drive.

   ![Search Archive](image)

   d. Select **Archive**. This should be the Total Recall VR archive that you wish to search.

   e. Optionally, select **Network Share** if you wish to see the details of the network drive that contains the archives. For example:

   ![Network Share Details](image)
The embedded GUI does not make provisions for the configuration of network drives. You must use Total Recall VR Remote Manager to configure network drives.

5. Select **OK** to search the archive. The search will identify all recordings that match the search criterion and display them. For example:

![Total Recall VR Embedded GUI](image)

The table will be empty if no recordings match the search criterion.

Note that the recordings are displayed sorted in reverse order of start time, i.e. latest recording on top.

6. If the search results in 1000 recordings or less, then all recordings will be shown. However, due to screen space limits, only 25 or so will be visible. Use the [▲] and [▼] keys to view rows that are not shown.

If you are searching a USB archive or a network archive, and if you locate recordings that are important to you, then you can tag them by pressing the [*] key when the screen cursor is on the rows that represent the recordings. Later, you can use the **Tag** parameter to create a criterion that identifies the recordings that you tag.

It is not possible to tag recordings that reside in archives which are located on CD, DVD or BD discs.

As you navigate the table, notes associated with recordings will be shown in the notes area of the screen. For example:
7. If the search results in more than 1000 recordings, then the screen will display recordings in groups of 1000. Press the [] key when re-play is not in progress to display older recordings. Similarly, press the [] key when re-play is not in progress to show younger recordings.

8. To perform another search, start from step 1.

The Search screen is generally static. It shows the results of the last search. However, in some circumstances it is useful to automatically display recordings as they complete, i.e. dynamically update the content of the Search screen with most recent recordings as recordings complete.

To display recordings as they complete on the Search screen simply select Recent Calls. The Recent Calls button will start flashing to indicate that the Search screen is in auto-update mode.

![Figure 12: Flashing Recent Calls Button](image)

Pressing any key will bring the Search screen back to its normal operating mode (static display).
9.2. Search Criteria Parameters

As the previous section explains, the embedded GUI displays the Search Criterion Dialog to allow users to define search criteria.

To add parameters to the criterion:

1. Tick the check box associated with the parameters that should be part of the criterion.
2. Enter values for each parameter that will be part of the criterion.

The parameters are combined to form a conjunction (joined with ‘and’) when constructing the criterion. For example, the settings shown on the subsequent capture of the Search Criterion Dialog will result in a search criterion which will identify all recordings which have call classification set to “Incoming” AND a source or destination Total Recall VR Extension identifier set to “2002”.

![Search Criteria Dialog]

**Figure 13: Example Search Criterion**

The individual parameters are:

**Date**

Use the *Date from* and the *Date to* parameter to identify recordings that started between the specified dates (inclusive).

**Time**

Use the *Time from* and the *Time to* parameter to identify recordings that started between the specified times (inclusive).

**Number**

Use the *Number* parameter to identify recordings that contain the specified sequence of digits present in the Total Recall VR Mapped identifiers.

**Extension**

Use the *Extension* parameter to identify recordings with Total Recall VR Extension identifiers that match the specified value exactly.
Tag

Use the Tag parameter to identify recordings with the have the tagged flag set.

Direction

Use the Direction parameter to identify recordings of telephone calls which were classified as specified by the value of the parameter.

Channel

Use the Channel parameter to identify recordings that were created on the specified recording channel. This is mainly useful for recordings on analogue channels as one-to-one mapping exists between analogue channels and recording channels.

9.3. Configuration

9.3.1. Search

Total Recall VR does not have any search specific configuration.

Use Total Recall VR Remote Manager to configure the network drive that contains Total Recall VR archives that users can access from the embedded GUI.

9.3.2. Recent Calls

The recent calls parameters define the behaviour of the Search screen when it is in auto-update mode.

By default, the Search screen will update every 15 seconds and it will show the 50 most recent recordings.

Change Recent Calls Parameters

1. Navigate to the Options Menu Screen using the [Menu] key. Select General Settings and then select Recent Calls to display the Recent Calls Settings dialog.
2. Select **Update Period**. The Search screen will automatically update every number of seconds as specified by this parameter.

3. Enter **Records to Show**. This is the maximum number (up to 999) of recordings that the Search screen will show while it is in auto-update mode.

5. Select **OK** to record the parameters in the system configuration.

The new parameters take effect immediately.
10. Playing
Control-rich audio player is a standard Total Recall VR feature.

Controls include: start, stop, pause, fast-forward, double speed fast-forward and rewind.

The audio player is purpose built for playing audio which is stored in **Total Recall VR (.trc) files** in one of the following media formats:

- HQVQ, 8000Hz, 7.9Kbps, mono.
- G.711 A-law, 8000Hz, 64Kbps, mono.
- G.711 μ-law, 8000Hz, 64Kbps, mono.
- SPEEX Q8, 8000Hz, 15Kbps, mono.

The embedded GUI makes provisions for paying recordings that reside on the system itself and recordings that are stored in archives that are located on CD, DVD or BD discs, USB keys and disk drives and network drives.

Play from a USB key/disk is available on Total Recall VR Classic Desktop and Rack only if fitted with a USB connector instead of a MODEM connector.

10.1. Player Interface – Classic Models
The player interface of the Total Recall VR Classic models comprises of:

- Player keys on the control keypad.
- Built in audio amplifier and 2W speaker.
- Headphone jack. This is a standard three conductor, 3.5mm, stereo audio jack for connection of headphones or external speaker.
- Line output jack. This is a standard three conductor, 3.5mm, stereo audio jack for connection of an external recorder or a line input of a PC or amplifier.
- Volume control thumb wheel.

For further information on the player interface see the quick start guide for the Classic Desktop [5] and the Classic Rack [6].

10.2. Player Interface – LinX Omnia
The player interface on the Total Recall VR LinX Omnia model comprises of:

- Player keys on the control keypad.
- Built in audio amplifier and 2W speaker.
- Headphone jack. This is a standard three conductor, 3.5mm, stereo audio jack for connection of headphones or external speaker.

- Line output jack. This is a standard three conductor, 3.5mm, stereo audio jack for connection of an external recorder or a line input of a PC or amplifier.

- Volume control thumb wheel.

For further information on the player interface see the quick start guide for the Max Rack [7].

10.3. **Player Interface – Other LinX Models**

The Player interface on the Total Recall VR LinX models other than LinX Omnia comprises of optional speakers or headphones that are connected to the LINE OUT output that is available on the processing unit and player controls on the control keypad.

Speakers and/or headphones are not supplied with your Total Recall VR. We recommend you invest in a quality stereo speakers or headphones.

Any speakers or headphones that work with your PC will work with your Total Recall VR.

As an alternative, you can use the mono speaker that is part of the colour LCD screen.

For further information on the player interface and how to use the mono speaker that is part of the LCD screen see the quick start guide for the LinX Essence [9] and the LinX Evolution [11].

10.4. **How to …**

To play a recording, first navigate to the Search Screen using the [Menu] key and search for it. Section 9 Searching explains searching in detail.

Once you have located the recording:

**Playing a Recording**

1. Use the [▲] and [▼] keys to position the screen cursor on the recording that you wish to play.

2. Press the [▶], or the [Select], key to start playing.
The following will happen when you start playing:

- The play indicator “[-----]” will appear in the centre bottom of the Search screen.
- Audio will be heard from the built-in speaker, or phones if connected.

3. While playing is in progress you can use the [►], [►►] and [◄◄] keys to fast forward, fast forward at double speed and rewind respectively.

4. In additions, while playing is in progress you can use the [▶] key to pause and re-start playing.

5. Press the [■] key to stop playing.

   Play automatically stops when you try and navigate with the [▲] and [▼] keys while play is in progress as well.

   Play automatically stops when you press the [Select] key while play is in progress as well.

The following will happen when you stop playing:

- The play indicator “[-----]” will disappear from the centre bottom of the Search screen.
- Audio will cease.

6. Repeat steps 2 to 4 to play other recordings.

On LinX models you can use the [#] key while playing is in progress to activate “sticky play”. Total Recall VR will automatically continue playing with then next recording in
the list at the end current recording. The play indicator changes to “#---->-------#” to indicate that “sticky play” is active.

Sticky play is useful if you wish to play a set of recordings in a sequence. To do so, first search for the recordings. Then start playing the first one. While the first one is playing, press the [#] key to activate “sticky play”. Total Recall VR will play all recordings by automatically starting to play the next recording as it finishes playing the current one. Press the [ ■ ] key to stop playing at any time.

10.5. Configuration

10.5.1. Playing

Total Recall VR does not have any player specific configuration.

Use Total Recall VR Remote Manager to configure the network drive that contains Total Recall VR archives that users can access from the embedded GUI.
11. Archiving

Archiving is possibly the most comprehensive feature that is available on every Total Recall VR.

Every Total Recall VR has an on-board archiving device that is capable of creating searchable archives of recordings on CD-R, CD-RW and DVD+RW discs. Optionally, systems can be fitted with an archiving device that can create searchable archives on BD-R and BD-RE discs.

Total Recall VR does not support disc types other than CD-R, CD-RW, DVD+RW, BD-R and BD-RE.

<table>
<thead>
<tr>
<th>Encoding</th>
<th>CD-R or CD-RW</th>
<th>DVD+RW</th>
<th>BD-R(E)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HQVQ</td>
<td>150 audio hours</td>
<td>1100 audio hours</td>
<td>6700 audio hours</td>
</tr>
<tr>
<td>SPEEX</td>
<td>75 audio hours</td>
<td>550 audio hours</td>
<td>3350 audio hours</td>
</tr>
<tr>
<td>G.711</td>
<td>20 audio hours</td>
<td>160 audio hours</td>
<td>800 audio hours</td>
</tr>
</tbody>
</table>

The following table shows the maximum audio capacity of such archives:

In addition to the on-board archiving device, Total Recall VR can create searchable archives on a single USB key or disk drive. The maximum audio capacity of such archives depends on the free space on the USB key or disk drive.

The Total Recall VR Classic Desktop and Rack support USB key/disk archives only if fitted with a USB connector instead of a MODEM connector.

Finally, Total Recall VR can create searchable archives on Linux™ and Windows™ network drives. Each of these archives can contain as many as 250,000 recordings, if disk space allows it. Multiple archives can reside on the same network drive.

In addition, it makes provisions for automatic archiving to CD-R, CD-RW, DVD+RW, BD-R and BD-RE discs, USB keys and network drives. This function automatically archives all recordings that have not been archived on regular intervals.

It is highly recommended to archive on regular basis either manually or automatically.

If you depend on automatic archiving, make sure to replace CD, DVD and BD discs and make space on USB and network disks as they become full.

11.1. Archives

Total Recall VR creates searchable archives which contain recordings as well as additional data for each recording that exist in the archive.

By default, Total Recall VR appends to existing archives if instructed to archive to a disc or drive that has an existing archive. If a recording already exists in an archive, then Total Recall VR will not archive it again during subsequent session that involve the recording and the archive that contains it.

Total Recall VR appends to existing archives on CD, DVD and BD discs by adding sessions. Each session updates the disc directory, writes recordings and additional data and is closed with an ‘end of session’ marker. Archiving to disc should be done thoughtfully, as each session marker uses approximately 10 MB of disc space. Therefore, to minimise wasted space, it is advisable to archive as many recordings as possible each time you archive, rather than archiving smaller numbers of recordings more often.

Always use clean and preferably new discs for Total Recall VR archives. Discs that have other than Total Recall VR archive sessions on them may fail to work as expected.

Total Recall VR opens and closes the drive tray when archiving to CD media. Use DVD or BD media if this is causing a problem for you (for example when Total Recall VR is located in a constrained space).
Further, Total Recall VR has an in-built NFS and SAMBA client to access NFS and Windows network drives. Each network drive can contain more than one archive, each with up to 250,000 records. The name of each archive is the date and time when it was created in the following format: yyyyymmddhhmm (that is a 4 digit year, followed by two digit month, day of month, hour of day and minute).

Finally, Total Recall VR uses a directory named ‘trvr-archive’ as its archive on USB keys/disks. As a result, USB keys can contain other directories and files in addition to the Total Recall VR archive.

Do not connect more than one USB key or disk to Total Recall VR at one time. Total Recall VR can archive to USB key/disk only when one key/disk is connected to it.

11.2. How to …

As stated earlier, the embedded GUI makes provisions for on-demand and automatic archiving.

To archive a user defined set of recordings on-demand, first navigate to the Search Screen using the [Menu] key.

Then, to create a new archive or append to an existing one:

**Archive On-Demand**

1. Optionally, perform a search that identifies the recordings that you wish to archive. Section 9 Searching explains searching in detail.

   You can skip this step if you wish to archive all recordings.

2. Optionally, and if you perform a search, then you can further refine the set by tagging recordings that you wish to archive.

   To tag recordings:
   
   a. Use the [▲] and [▼] keys to position the screen cursor on the recording that you wish.

   b. Press the [*] key to tag it.

   You can skip this step if you wish to archive either all recordings or the recordings that were identified by the search during step 1.

3. Select **Archive** to display the Manual Archive dialog.
4. Select **Archive Calls**. Note how **Number of Calls** and **Call Size (MB)** change to indicate the actual number of recordings that will be archived and the total disk space (in megabytes) that they will take when placed in the archive as you change the value for this parameter.

Choose:

- All Calls – to archive all recordings that exist on the system.
- Found Calls – to archive all recordings that were identified by the last search. This option will not be available if you skip step 1.
- Unarchived Calls – to archive all recordings that have not been archived to date.
- Tagged Calls – to archive all recordings that are tagged. Note that this will archive all recordings that exist on the system and are tagged. This may be more recordings than you actually tag during step 2 as there may be recordings which were tagged previously.

5. Select **Archive Device**. Choose:

- Disc - if you wish to archive to a CD, DVD or BD disc. Then insert a CD-R, CD-RW, DVD+RW, BD-R or BD-RE disc into the system drive.
- USB - if you wish to archive to a USB key or disk drive. Then attach a USB key or a disk drive to the system.
- Network Share – if you wish to archive to a network drive. Optionally, select **Network Share** to view the details of the network drive that contains the archives. For example:
The embedded GUI does not make provisions for the configuration of network drives. You must use Total Recall VR Remote Manager to configure network drives.

6. Select **OK** to display the Archive Option dialog if you are logged in as Administrator. This dialog is not shown to Users.

![Archive Option Dialog](image)

This dialog gives you the option to delete the recordings that are successfully stored in the archive after the archiving operation completes. Select:

- **No** – (default) to leave the recording on the system after archiving. Archiving will begin immediately after you select **No**.

- **Yes** – to delete the recordings **after archiving**. Archiving will begin immediately after you select **Yes** and all recordings that are successfully stored in the archive will be removed (deleted) from the system.

- **Cancel** – to cancel the archiving operation.

7. Select **OK** to begin archiving. A dialog will show the progress. For example:

![Archiving Dialog](image)

If you selected to archive to a CD, DVD or BD disc, and the archive is large enough so it spans multiple discs, then the system will prompt you to insert new discs when needed. It is possible to end the archive process when prompted for a new disc.

8. When complete, the dialog will show an **Ok** button. Select it to return to the Search screen.
Unlike on-demand archiving, automatic archiving is a “set and forget” operation. Well mostly – you must make sure to replace CD, DVD and BD discs and make space on USB and network disks as they become full.

If you depend on automatic archiving, make sure to replace CD, DVD and BD discs and make space on USB and network disks as they become full.

To start automatic archiving simply configure Total Recall VR as described in section 11.3.2 Auto Archiving.

11.3. Configuration

11.3.1. On-demand Archiving
Total Recall VR does not have any configuration that is specific to on-demand archiving.

Use Total Recall VR Remote Manager to configure the network drive that contains Total Recall VR archives that users can access from the embedded GUI.

11.3.2. Auto Archiving
By default, automatic archiving is disabled.

You can change the configuration to:

- Just remind you that it is time to archive when the occupancy of the disks reaches a pre-defined level. In this case the system will display a dialog on the screen and start emitting a “beep” sound at regular intervals to alert you.

- Automatically archive recordings, which have not been archived, at regular intervals.

The two options can be combined.
Change Auto Archiving Parameters

1. Navigate to the Options Menu Screen using the [Menu] key. Select Archive Settings to display the Archive Settings dialog.

2. Optionally tick Reminder, and select a level, if you wish to enable visual and audible reminder to archive when the occupancy of the system disks reaches the specified level.

   This does not activate auto archiving. You need to manually archive when the reminder activates.

3. Tick Auto Archive Every, and select a period, to enable automatic archiving at every period.

4. Select Archive Device. Choose:
   - Disc - if you wish to archive to a CD, DVD or BD disc. Then enter a CD-R, CD-RW, DVD+RW, BD-R or BD-RE disc into the system drive.
   - USB - if you wish to archive to a USB key or disk drive. Then attach a USB key or a disk drive to the system.
   - Network Share – if you wish to archive to a network drive. Optionally, select Network Share to view the details of the network drive that contains the archives. For example:
The embedded GUI does not make provisions for the configuration of network drives. You must use Total Recall VR Remote Manager to configure network drives.

5. The dialog will display information on when the next automatic archive will occur just above the row of buttons.

6. Select **OK** to record the configuration.

The change is immediate. The system will enable automatic archiving and perform the first archive automatically at the anniversary of the first period.
12. System Maintenance

12.1. System Information

To view the current system information:

View System Information

1. Navigate to the Options Menu Screen using the [Menu] key. Select Maintenance and then select System Information to display the System Information dialog.

2. The dialog displays:
   - **Software Revision** - the current version of the Total Recall VR application.
   - **Analog Channels** - the analogue recording channel count and configuration.
   - **ISDN Channels** – the ISDN recording channel count.
   - **VoIP Channels** – the VoIP recording channel count.
   - **Recorder ID** - the current ID of the system. This is the only parameter that you can modify - see section 6.6 Recorder ID.
   - **Stored Calls** - the total number of recordings that are stored on the system disks.
   - **Disk Usage** – system disk occupancy, in precent.
   - **Next Filter Change** – the date when you should replace the system filter.
• **Time Zone Data** – the version of the time zone data file that is currently on the system.

3. Select **OK** to return to the Options Menu screen.

### 12.2. Application Upgrade

Upgrades affect operating system and application files only.

⚠️ However, it is strongly recommended that you archive all recordings before attempting an upgrade.

We release regular updates of the Total Recall VR application to add new features and correct problems with existing features. In addition, we update time zone definition files with every software update. This ensures that Total Recall VR has the correct dates for day-light saving changes for various time zones around the world.

To upgrade the application on a Total Recall VR you must first obtain, or create, an upgrade disc with the new version of the application.


Once you have the disc, to upgrade the application:

#### Upgrade Application

1. Navigate to the Options Menu Screen using the [Menu] key. Select **Maintenance** and then select **System Information** to display the System Information dialog.
2. Select **Upgrade** to initiate the upgrade process.

3. Insert the upgrade disc in the system drive and select **Ok** to upgrade the system.

4. Follow the on screen instructions to complete the upgrade.
Total Recall VR will automatically restart at the end of the upgrade process. This is intentional. The new application version will be running when it starts again.

12.3. **Backup & Restore Settings**

A backup disc of the Total Recall VR application configuration should be kept in a safe place at all times. The disc can be used to restore the Total Recall VR application configuration to a known state if it is “corrupted” in any way.

To create a backup disc:

*Create Application Configuration Backup Disc*

1. Navigate to the Options Menu Screen using the [Menu] key. Select **Maintenance** and then select **Save Settings to Disc** to start the backup process.

2. Insert a blank CD-R disc in the system drive. You can use a CD-RW, DVD+RW, BD-R or BD-RE disc as well.

3. Select **OK** to write the current system configuration to the disc.

4. When complete, store the disc in a safe place.

When you must restore the configuration to a known state:

*Restore Application Configuration from Backup Disc*

1. Navigate to the Options Menu Screen using the [Menu] key. Select **Maintenance** and then select **Load Settings to Disc** to start the restore process.
2. Insert a backup disc with Total Recall VR settings in the system drive.

3. Select OK to restore the settings.

Total Recall VR will automatically restart when at the end of the restore process. This is intentional.

12.4. System Shutdown

Never turn power off unless instructed on the screen to do so. Shut down Total Recall VR using the following procedure.

You risk data loss if you simply turn power off while Total Recall VR is operational and recording.

You must shut down Total Recall VR before turning power off:

**Shutdown Total Recall VR**

1. Navigate to the Options Menu Screen using the [Menu] key.
2. Select **System Shutdown**. Total Recall VR will ask you to confirm the shutdown.

3. Total Recall VR will ask you to confirm. Select **OK** to shut down the system. DO NOT TURN POWR OFF UNTILL THE SHUTDOWN COMPLETES.
Total Recall VR will stop all recording and perform an orderly shutdown.

If your model is Total Recall VR Classic, then you must use the power on/off key to turn power off. Total Recall VR Max models power down automatically.

12.5. Database Rebuild

Database rebuild is a process which Total Recall VR uses to reconstruct the database of additional information about recordings from information stored in the recording files. This may be necessary when the database is damaged.

The process may take few hours to complete if there are a large number of recordings on the system.

Total Recall VR DOES NOT record while rebuilding the database.

DO NOT interrupt the rebuilding of the database. Doing so may result in an irreversible damage to the database and recordings.

Total Recall VR automatically rebuilds its database when it starts after what is known as “dirty shutdown”. A “dirty shutdown” is any system shutdown other than the one described in section 12.4 System Shutdown.

However, it is possible to trigger the process manually as well:

Rebuild the Database

1. Navigate to the Options Menu Screen using the [Menu] key. Select Maintenance and then select Rebuild Database to initiate the rebuilding process.
2. Total Recall VR will ask you to confirm. Select **OK** to start the database rebuild process.

3. Total Recall VR will immediately stop recording and start to rebuild the database. Progress will be shown on the screen.

The rebuild process checks the integrity of the recording files as well. Files that can be read but fail the integrity check are marked as “damaged”. Damaged recordings show with the “X” flag on the Search screen. Files that cannot be read at all will be removed (deleted) during the rebuild process.

12.6. **Erase CD-RW, DVD+RW and BD-RE Disc**

Total Recall VR can erase a CD-RW, DVD+RW or a BD-RE disc when one is placed in the system drive.

For security reasons, Total Recall VR destroys all data on the discs when erasing discs. It will not be possible to recover any data from erased discs after the operation.

The erase operation may take considerable time to complete. The following table shows the time for different types of discs:
<table>
<thead>
<tr>
<th>Disc Type</th>
<th>Erase Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD-RW</td>
<td>5-10 minutes</td>
</tr>
<tr>
<td>DVD+RW</td>
<td>20-30 minutes</td>
</tr>
<tr>
<td>BD-RE</td>
<td>60-80 minutes</td>
</tr>
</tbody>
</table>

Total Recall VR may not be able to erase all brands of discs, in particular CD-RW discs as the erase operation for CD-RW discs largely depends on the drive firmware.

If you are getting errors when erasing CD-RW discs, try a different brand of disc.

To erase a disc:

**Erase a CD-RW, DVD+RW or a BD-RE Disc**

1. Insert a disc in the system drive.
2. Navigate to the Options Menu Screen using the [Menu] key. Select **Maintenance** and then select **Erase Disc**.
3. Total Recall VR ask you to confirm:

   ![Erase Disc Confirmation](image)

4. Select **OK** to (quick) erase the disc.

**12.7. Deleting Recordings**

Total Recall VR is a secure recording system and has been designed so it is not possible to manually delete recordings.

However, Total Recall VR has an in-built auto-cleaning function which ensures that the system has enough free space on its disks to continue recording endlessly.
A working archiving strategy must be implemented to avoid losing recordings as a result of auto-cleaning.

In general, the auto-cleaning function automatically deletes recordings when the number of recordings reaches more than the maximum records (see table in section 7.1 Recording Storage) or the disk occupancy reaches 95% whichever occurs first. It removes oldest first recordings until the number of recordings reduces to the low watermark (see table in section 7.1 Recording Storage) or less, and the disk occupancy is below 88%.

It is possible to specify the maximum life time of recordings - see section 7.4.5 Call Settings. If this is the case, then the auto-cleaning function may never run as expired recordings are purged from the system on hourly basis.

In addition to the automatic deletion during normal operation, Total Recall VR automatically purges recording files which it cannot read during database rebuild – see section 12.5 Database Rebuild.

Finally, recordings can optimally be deleted when creating archives – see section 11 Archiving.

12.8. Cleaning the Air Filter

As with most computing devices, Total Recall VR has a fan that provides air flow through the system to keep it at operating temperature. However, unlike most computing devices, the air that enters the system is kept clean by a filter.

Every 3 months or so the embedded GUI will display a message and start generating an audible beep to alert you to the fact that it is time to check and clean the filter.

For example:

Select OK to dismiss the dialog. However, at this point in time the filter should be washed in warm soapy water, and then rinsed thoroughly and allowed to dry completely prior to being replaced.
New filters are available from us or your local Total Recall VR supplier.
13. Glossary

Our guides use certain terms and abbreviations.

13.1.1. Terms

Extensions

Extensions are a Total Recall VR concept that helps identify the source and the destination of recordings. Extensions can be numbers or any free format text. For example calling and called numbers can be classified as extensions if they match an entry in the Internal Dial Plan.

Extension Mapping

Extension mapping is a process used by the Total Recall VR to convert raw identifies of sources and destinations of recordings to user friendly identifiers. For example, when recording VoIP calls the ‘From’ and ‘To’ identifiers may be rather cryptic, say ‘ext122@sip.myenterprise.com’. The extension mapping process can convert this identifier to ‘122’ or ‘Extension 122’.

Internal Dial Plan

Internal Dial Plan is Total Recall VR configuration which helps it determine which extensions are internal to the enterprise.

Recording Channel

Total Recall VR uses recording channels to capture audio on analogue, VoIP or ISDN sources. The number of recording channels can be different to the number source channels. For example, a Total Recall VR can have 20 ISDN channels while connected to an ISDN PRI link which has 30 B channels.

Remote Manager

A powerful Java™ based client application for Total Recall VR systems. It installs on Windows™ PCs and can be used to securely configure and manage multiple Total Recall VR systems over a TCP/IP network. In addition, it can be used to monitor recordings in progress in real time as well as search for and then play past recordings.

RoD Client

A small Java™ based taskbar application for Total Recall VR systems. It installs on Windows™ PCs and allows users to control in real-time which calls are recorded. In addition, enables users to add notes to recordings of calls while calls are being recorded.

Supervisor Client

A small Java™ based client application for Total Recall VR systems, It installs on Windows™ PCs and allows users to manually control (start, stop, …) recording on analogue channels. In addition, it can be used to monitor recordings in progress in real time as well as add notes to recordings in progress.

Total Recall VR

The system that is the subject of this manual.
13.1.2. Abbreviations

Most definitions courtesy of “Wikipedia, the free encyclopaedia”.

CLI: Calling Line Identification

A telephony intelligent network service that transmits the caller's telephone number and in some places the caller's name to the called party's telephone equipment during the ringing signal or when the call is being set up but before the call is answered.

D/A: Digital to Analogue

A digital-to-analogue converter (DAC or D-to-A) is a device for converting a digital (usually binary) code to an analogue signal (current, voltage or electric charge).

DSP: Digital Signal Processor

A specialized microprocessor designed specifically for digital signal processing, generally in real-time computing.

DTMF: Dual-Tone Multi-Frequency

Used for telephone signalling over the line in the voice-frequency band to the call switching centre. The version of DTMF used for telephone tone dialling is known by the trademarked term Touch-Tone, and is standardised by ITU-T Recommendation Q.23. Other multi-frequency systems are used for signalling internal to the telephone network.

IP: Internet Protocol

A data-oriented protocol used for communicating data across a packet-switched internetwork.

IP is a network layer protocol in the internet protocol suite and is encapsulated in a data link layer protocol (e.g., Ethernet). As a lower layer protocol, IP provides the service of communicable unique global addressing amongst computers.

ISDN: Integrated Services Digital Network

A circuit-switched telephone network system, designed to allow digital transmission of voice and data over ordinary telephone copper wires, resulting in better quality and higher speeds than that available with the PSTN system.

LAN: Local Area Network

A computer network covering a small geographic area, like a home, office, or group of buildings.
**LCD: Liquid Crystal Display**

A thin, flat display device made up of any number of colour or monochrome pixels arrayed in front of a light source or reflector.

**NTP: Network Time Protocol**

A protocol for synchronizing the clocks of computer systems over packet-switched, variable-latency data networks. NTP uses UDP port 123 as its transport layer. It is designed particularly to resist the effects of variable latency (Jitter).

**PBX: Private Branch Exchange**

Also called Private Business eXchange, or PABX (Private Automatic Branch eXchange), a PBX is a telephone exchange that serves a particular business or office, as opposed to one a common carrier or telephone company operates for many businesses or for the general public.

**RTP: Real-time Transport Protocol**

The Real-time Transport Protocol (or RTP) defines a standardized packet format for delivering audio and video over the Internet.

**SMDR: Station Message Detail Record**

SMDR is a record containing information about recent system usage, including the identities of sources (points of origin), the identities of destinations (endpoints), and the duration of each call.

**SIP: Session Initiation Protocol**

An application-layer control (signalling) protocol for creating, modifying, and terminating sessions with one or more participants. These sessions include Internet telephone calls, multimedia distribution, and multimedia conferences.

**TCP: Transmission Control Protocol**

One of the core protocols of the Internet protocol suite, often simply referred to as TCP/IP. Using TCP, applications on networked hosts can create connections to one another, over which they can exchange streams of data using Stream Sockets.

**TRVR: Total Recall VR**

A professional voice logging and call recording system.

**UDP: User Datagram Protocol**

UDP is one of the core protocols of the Internet protocol suite. Using UDP, programs on networked computers can send short messages sometimes known as datagrams (using Datagram Sockets) to one another. UDP is sometimes called the Universal Datagram Protocol.

**VLAN: Virtual LAN**

A method of creating independent logical networks within a physical network.
VoIP: Voice over Internet Protocol

Also called IP Telephony, Internet telephony, Broadband telephony, Broadband Phone and Voice over Broadband, VoIP is the routing of voice conversations over the Internet or through any other IP-based network.

VOX: Voice Operated Switch

A switch that operates when sound over a certain threshold is detected.

[End of Document]