

Net-Link Windows Application User Handbook

1 Table of Contents

1	Table of Contents	2
2	Change History	3
3	About this Manual	4
4	Introduction	5
5	Running the Net-Link application for the first time	6
5.1	Licensing the Net-Link application	6
5.2	Application mode	6
6	Connecting to Net-Link units	8
6.1	Fixed server mode	8
6.2	Net-Link server – PC client mode	8
6.3	Established connection view	9
7	Application work area	10
7.4	Introduction	10
7.5	Main workspace area.....	10
7.6	Content/connections area	12
7.7	Playback controls area	20
7.8	Toolbar and menus	22
8	Retrieving stored content	27
9	Decryption keys	30

2 Change History

Version	Main Changes from Previous Version	Edited By
v1.2	Initial Release of quickstart manual	FS, DE
v1.4	Updated into user's handbook. Version number aligned with software version.	DE
v1.7	Updated handbook for release of NetLink 1.7. Version number aligned with software version.	DE 29.7.08
v2.1.1	Updated handbook for release of NetLink 2.1.1. Descriptions of different Net-Link operation modes. Version number aligned with software version	DE 21.11.08
v2.3	Updated handbook for release of NetLink 2.3. Adapated for new connected unit menu structure. Description of video switch selection also added. Version number aligned with software version.	DE 5.2.09

3 About this Manual

This manual describes the operation of the domo Net-Link Windows Application.

4 Introduction

Welcome to the demo Net-Link user's handbook.

This handbook documents fully the features of the demo Net-Link Windows Application. This software provides all the decoding and management facilities needed to use the Net-Link system. All content can be controlled, managed, retrieved and played back to the user.

5 Running the Net-Link application for the first time

5.1 Licensing the Net-Link application

The first time the Net-Link application is run the user should be prompted for a license code with a popup window as follows:



The user should contact **domo** with the serial number. A license code will then be generated specific for the machine that the application is installed on.

5.2 Application mode

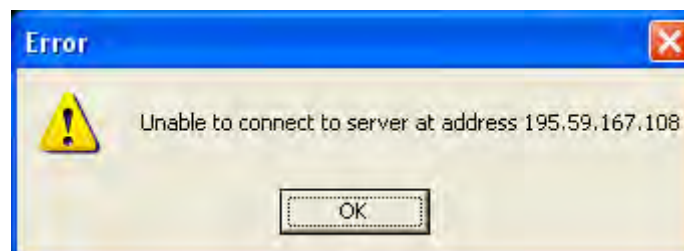
The Net-Link application can operate in two different modes.

Fixed server mode. In this mode, all communications between the Net-Link windows application and the Net-Link unit will go through a server running on a fixed IP address.

Netlink server - PC client mode. This is the "traditional" mode of Net-Link operation, whereas each Net-Link unit acts as a sever which Net-Link windows applications running on individual PCs connect to as clients.

The default mode, in which the application will start up when first installed is "Fixed server". In this mode the application will try to establish a connection to a server located at a fixed IP address on port 10001. Depending on setup of the computer on which the application is running, warning messages may appear to tell the user that the software is attempting to connect. It is recommended that the user unblocks any firewall settings which attempt to restrict the access of the application.

The application will attempt, by default, to connect to a server on IP address 195.59.167.108. This will normally fail after several seconds, presenting the user with the following information window:



The user should dismiss this window and then select the “Connection options” option from the “Options” menu. A window will appear as follows:

The screenshot shows a dialog box titled "Connection options". It contains the following elements:

- Message receive timeout: 4000 ms
- Download timeout: 4000 ms
- Exit download on timeout
- Current mode: Fixed server (dropdown menu)
- Server address: 195 . 59 . 167 . 108
- Server is not connected: Reconnect button
- Buttons: OK, Apply, Cancel

If fixed server mode is required, the user should enter the correct IP address for the server into the field marked “Server address” and click the “Apply” button. If connection to the server fails a window will appear to inform the user of this. If it is successful, the text below the server address field will change to “Server is connected”.

If “Netlink server – PC client” mode is required, the user should select this from the “Current mode” dropdown box and click the “Apply” button.

6 Connecting to Net-Link units

To connect to a remote Net-Link unit you must know its IP address as well as its 16 hex digit unique ID number.

To establish a connection either click the new connections button on the toolbar:

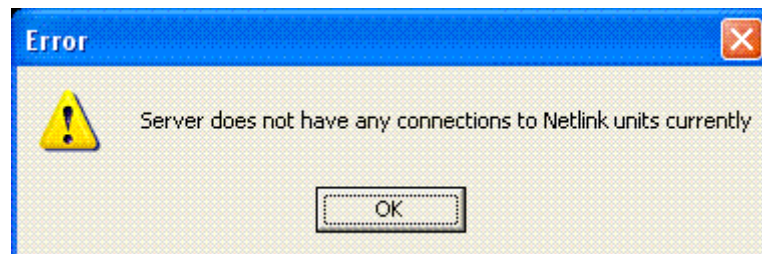


or select the “Create new connection” option from the “Options” menu.

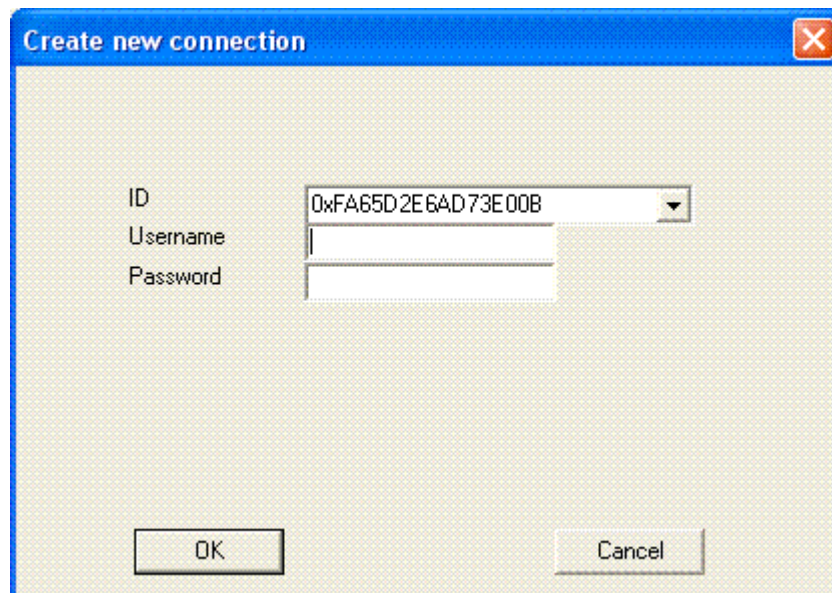
The type of window which will appear will depend on the mode in which the application is operating.

6.1 Fixed server mode

The application will request from the server a list of Net-Link units available. If the server does not have any connections from Net-Link units, a window will appear to inform the user of this as follows:



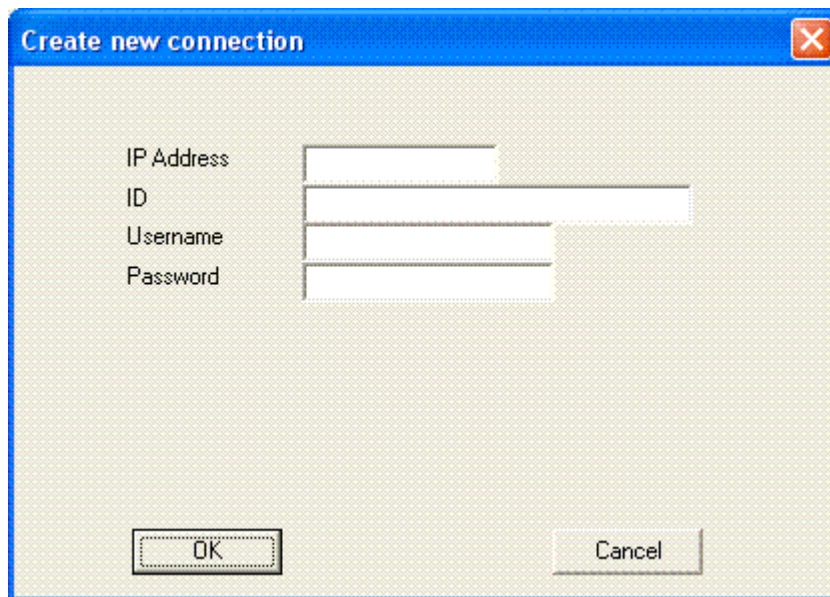
If any Net-Link units are available to connect to, a popup window will appear as follows:



The user should select the ID number of the Net-Link unit they wish to connect to from the dropdown box, enter the appropriate username and password and click the “OK” button to attempt to establish a connection to the Net-Link.

6.2 Net-Link server – PC client mode

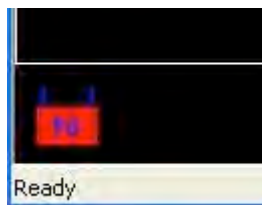
A popup window should appear as follows:



The user should enter either the IP address or the hostname (if dynamic DNS is being used for the Net-Link unit) into the “IP Address” field. The “ID” field requires the 16 digit hexadecimal ID of the Net-Link unit being connected to (this field is not case-sensitive). The appropriate username and password are entered into the relevant fields. When all appropriate fields are filled out the user should click the “OK” button to attempt to establish a connection to the Net-Link.

6.3 Established connection view

If a connection is successfully established an icon representing this connection will appear at the bottom of the main window like this:

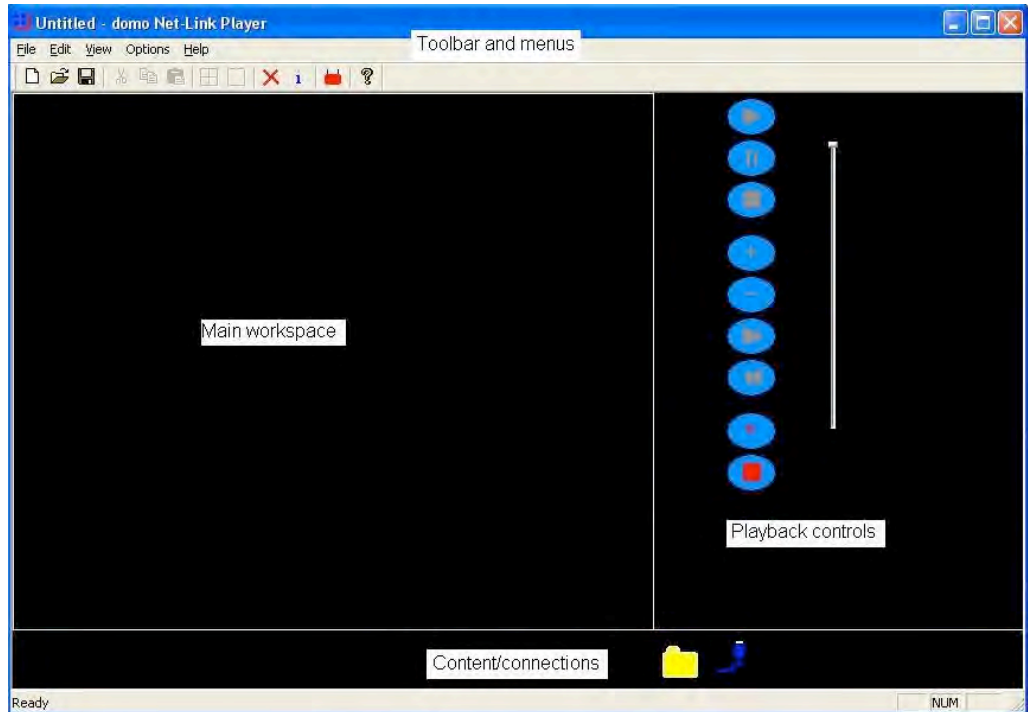


This icon can then be dragged and dropped into the main work area to view live content, or retrieve and view stored content from the unit. Alternatively, right-clicking the icon will present a pop-up menu with various options relating to the connection.

7 Application work area

7.4 Introduction

The main window of the application has four main areas:



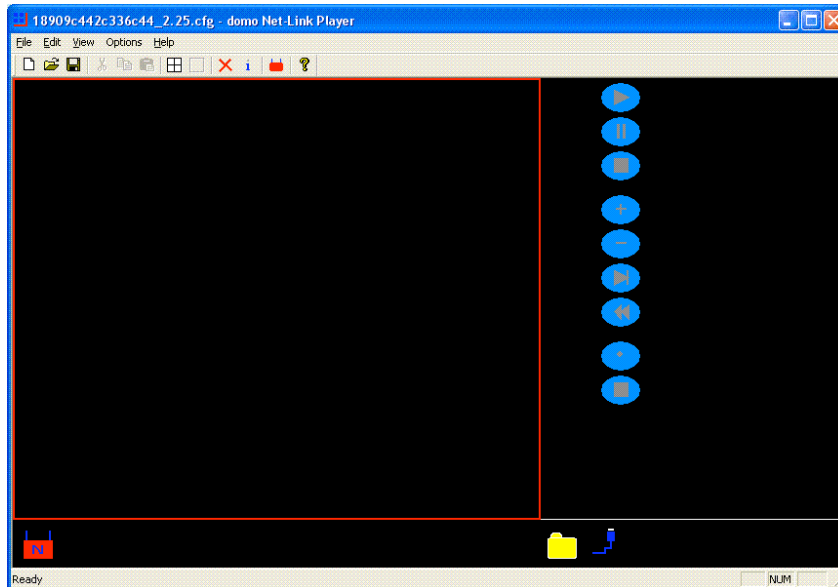
The main workspace can be divided into a number of workspace slots. Any one of these slots can be currently selected. The playback control area always refers to, and has effect on the currently selected workspace slot.


The content/connections area shows the user the currently available sources from which they can set up one of the workspace slots.

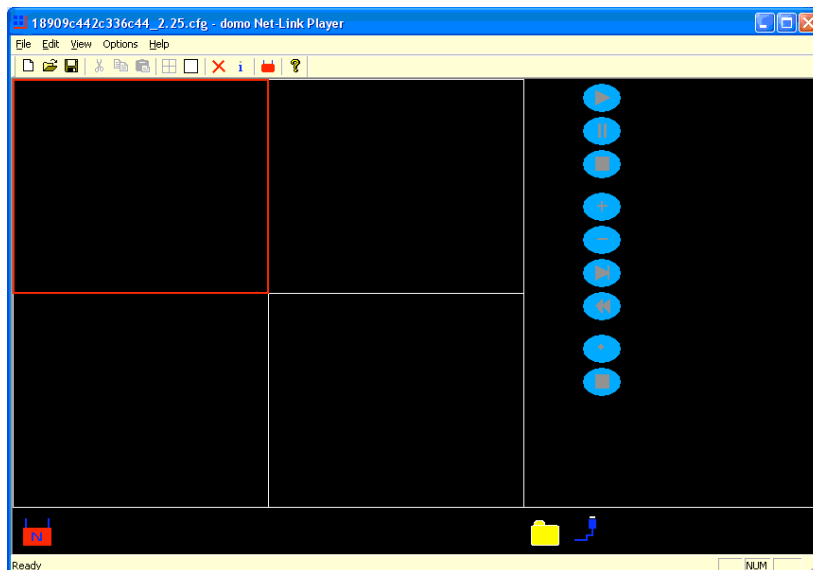
The toolbar and menus provide various options for setting up both the application itself and any connected Net-Link units, as well as the means to create and manage new Net-Link connections.


7.5 Main workspace area

When the work area is clicked with the left-button of the mouse, the active part should be highlighted in red:



Once an area of the window is selected, it can be divided up by either clicking the grid divide button , selecting the "Divide Grid" option from the "View" menu, or simply typing Ctrl-D. This will divide the selected part of the work area into four smaller areas, each of which can then be selected in the usual way:



An area that has been divided into four sub-areas can be undivided again by selecting any of the four sub-areas and either clicking the grid undivide button , selecting the "Undivide Grid" option from the "View" menu or typing Ctrl-U.

7.6 Content/connections area

Any slot within the work area can be set up by dragging and dropping one of the icons from the content/connections area. There are three icon types that may be displayed along the bottom.

7.6.1 Connection icon



This icon represents a connection to a Net-Link unit. Dropping this icon into a slot will present options for either live or stored content. Live content will be a thumbnail stream, stored content can be either thumbnails or full frame rate video.

If live content is selected, the application will attempt to negotiate a connection with the Net-Link for the thumbnail stream. If this is successful, the user will be prompted for a decryption key when the thumbnail images begin to arrive.

The connection icon can also be right-clicked. The user will then be presented with a popup menu containing numerous options for configuring the connection. The following options will appear in the menu:

Connection properties. Selecting this option will bring up a popup window containing appropriate information about the Net-Link connection. This will include the unit mode and features, any external units connected to the input slots of the Net-Link and the IP address and user login associated with this connection.

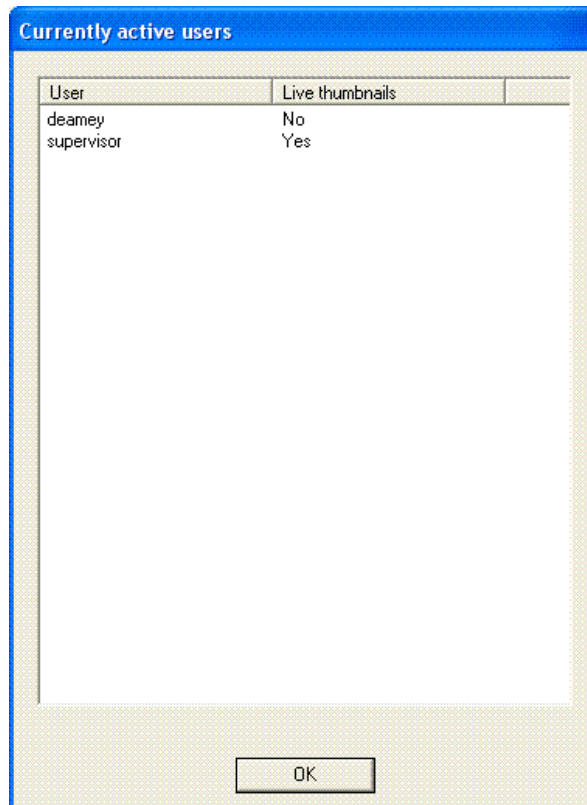
Close connection. Selecting this option will gracefully close the connection. Any live streams from the connection will also be shut down.

Also, four sub-menus will appear: **Users, Recording, Management** and **Advanced**.

The **Users** sub-menu contains the following options:

Edit user(s). This option will only appear if the user logged in has supervisor privileges. It enables the user logins to be created and deleted.

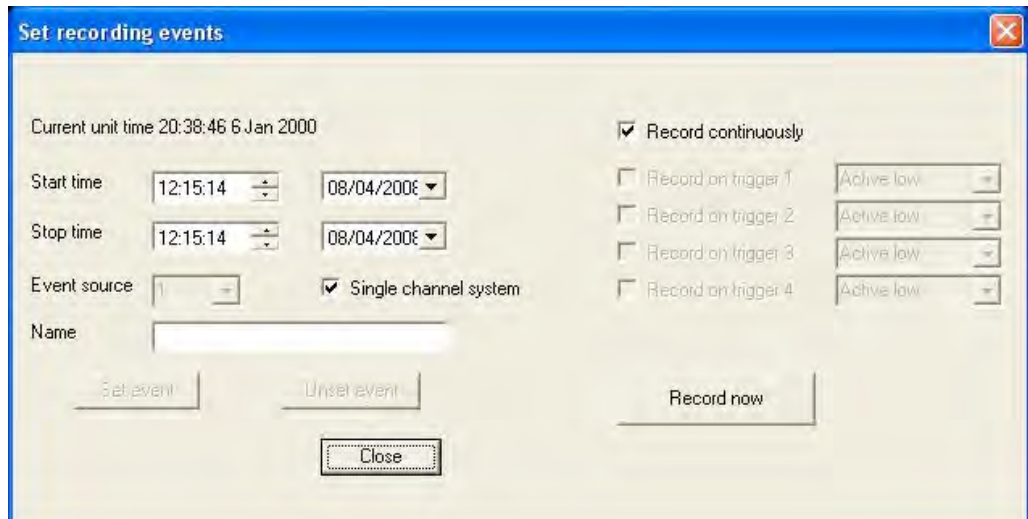
View active users. This option will launch a popup window containing a list of all currently active users and whether or not any of them are currently viewing live thumbnails:



The **Recordings** sub-menu contains the following options:

Hard disk status. This option will only appear if the connected unit has been fitted with a hard disk. A popup window will appear showing the capacity of the hard disk and its current occupancy.

Set recording event. This option will only appear if the connected unit has been fitted with a hard disk. A popup window will appear as follows:



The start and stop times the user sets up must be with relation to the units own clock. This is displayed at the top of the popup window. For Net-Link systems with more than one channel, the event source dropdown box can be used to select which channel is to be recorded. The checkbox next to this enables or disables the single/multiple channel selection. Each recording must also be given a name.

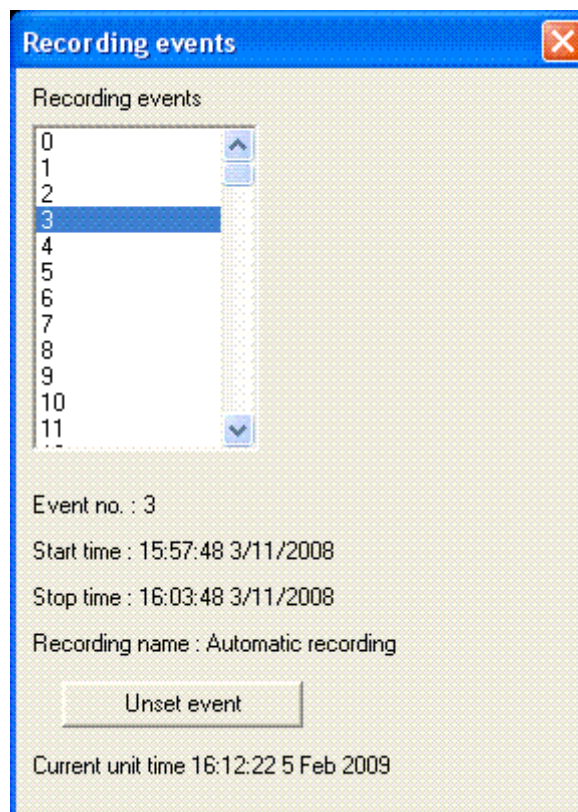
Settings are provided so that the Net-Link will either record continuously between the start and stop times, or will only record on seeing events on

any combination of the four trigger inputs. When not in “record continuously” mode, a combination of both triggers to watch and whether each of these triggers will activate recording on active high or low can be selected.

When all appropriate fields have valid information in them for a recording to setup, the user should click the “Set event” button. A popup prompt window will appear to inform the user of the success or otherwise of setting the recording event.

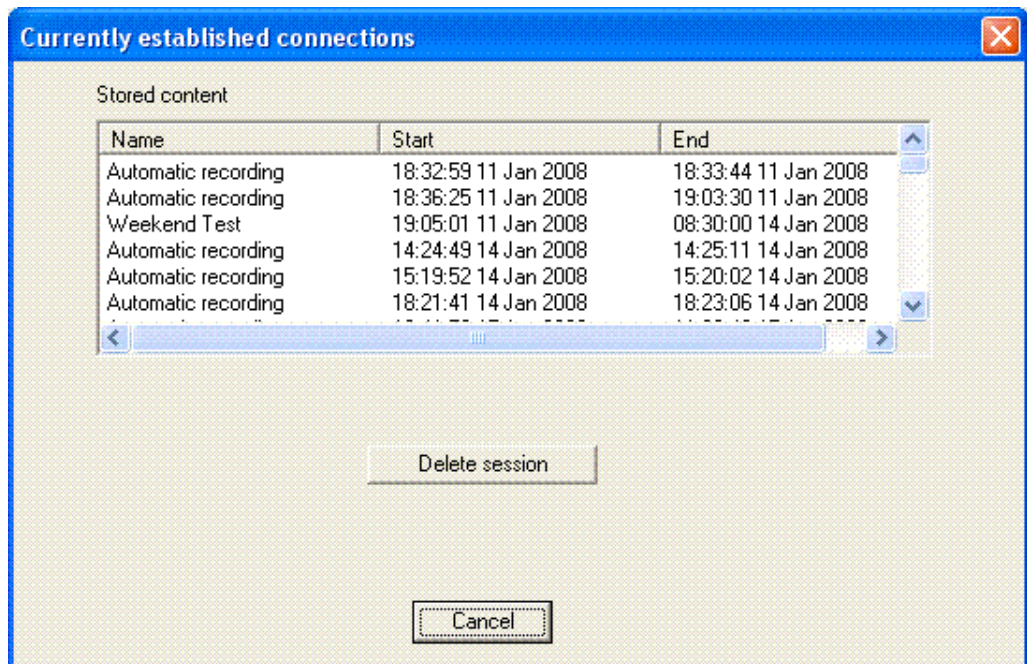
Alternatively, if the user simply wishes to start recording immediately, without any particular stop time, they can click the “Record now” button.

View recording events. This option will only appear if the connected unit has been fitted with a hard disk. A popup window will appear as follows:



This allows the user to select any of the 128 possible recording events and see whether it is set, the recording name and the start and stop times. If a selected event is set, a pushbutton allows the user to unset it. For reference, the current unit time is also displayed at the bottom of the popup window.

Delete recording(s). This option will only appear if the connected unit is fitted with a hard disk. A popup window will appear as follows:



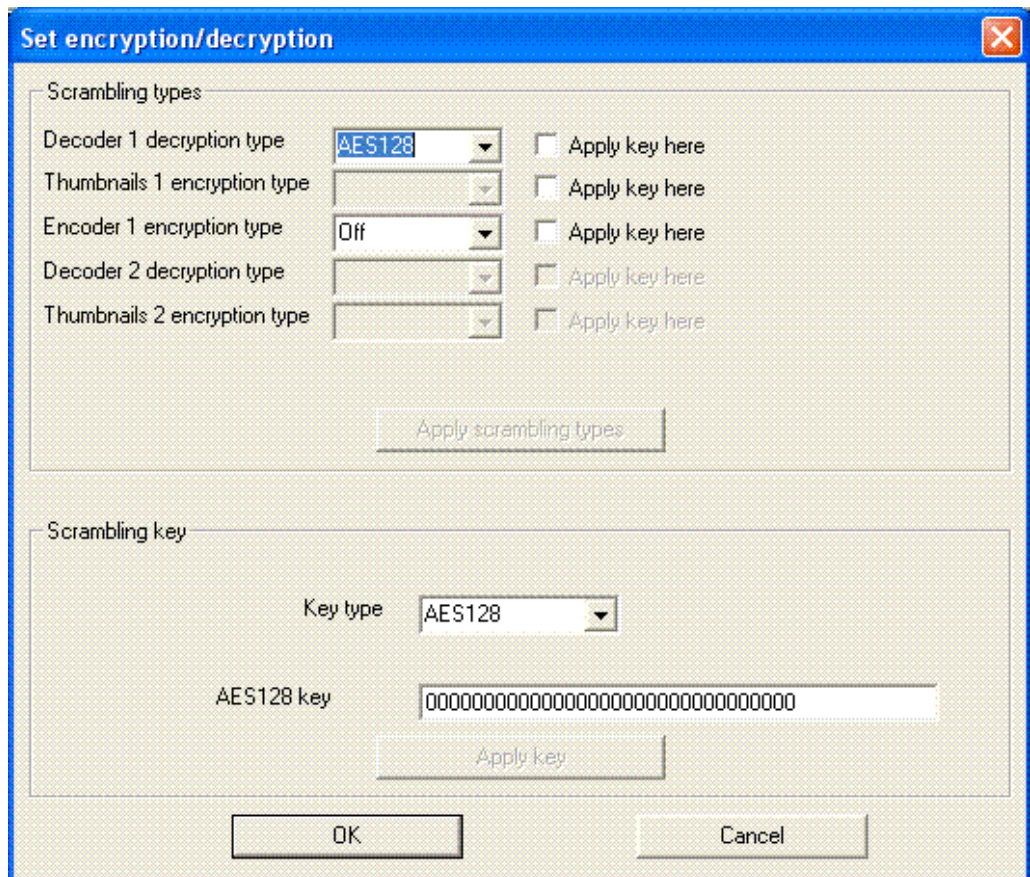
The window presents a list of all recordings on the hard disk. The user simply needs to select the appropriate recording and select "Delete session". An information window will appear informing the user of either success or failure of the deletion.

Record now/Stop recording. This option will only appear if the connected unit is fitted with a hard disk. It provides a quicker method of initiating or stopping a recording than the more protracted action of setting up a recording event. The option displayed depends on whether or not the Net-Link is currently recording. In this way, the user can just make the Net-Link start or stop recording immediately. A recording started in this manner will continue until the user explicitly stops it. The recording will be named "Automatic recording".

The **Management** sub-menu contains the following options:

Set unit time. This option allows the user to set the Net-Link units real time clock.

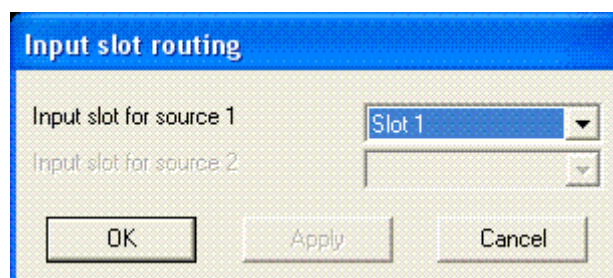
Set encryption key/type. This options enables the user to set up the encryption and decryption in use throughout the Net-Link setup. This may include the decryption on any input receivers, encryption on any input encoders, decryption in place on the Net-Links video decoders and the re-encryption of thumbnails. The Net-Link application will detect the setup of the Net-Link and only present the user with the appropriate options. A popup window will appear. This will appear as follows:



Encryption/decryption type can be applied independently of the encryption/decryption key for decoders, receivers and encoders. For thumbnail re-encryption the key and type are applied simultaneously. For this reason, drop-down selections are provided where appropriate to apply encryption/decryption type only. When a new selection is made, the “Apply scrambling types” button will be enabled, allowing the user to set the type.

To apply a key, the relevant key type must be selected in the lower part of the window, the key entered in the appropriate field(s) and then the part(s) of the system selected in the upper part of the window to which the user wishes to apply the key. In this way it is straightforward to set an identical key into multiple parts of the system simultaneously by checking multiple checkboxes. When this has been done, the “Apply key” button will be enabled, allowing the user to complete the process of setting the key.

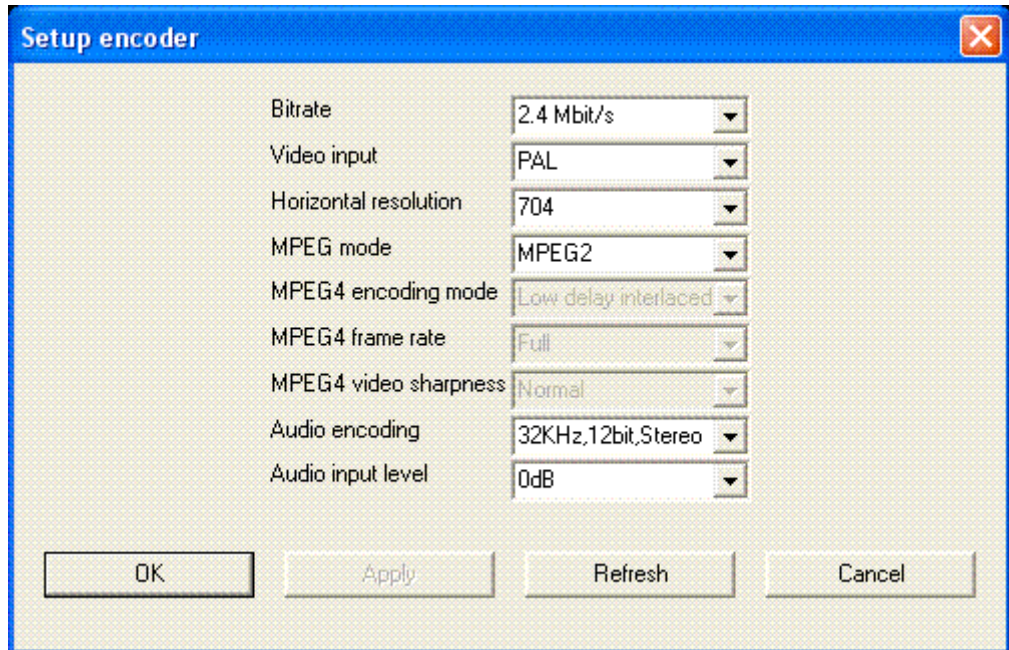
Input slot routing. This option allows the user to setup which of the two input slots is being used. Currently Net-link only supports one channel for use at any one time. Selecting this options will bring up the following popup window:



The greyed out option for “source 2” is intended for future releases of Net-Link.

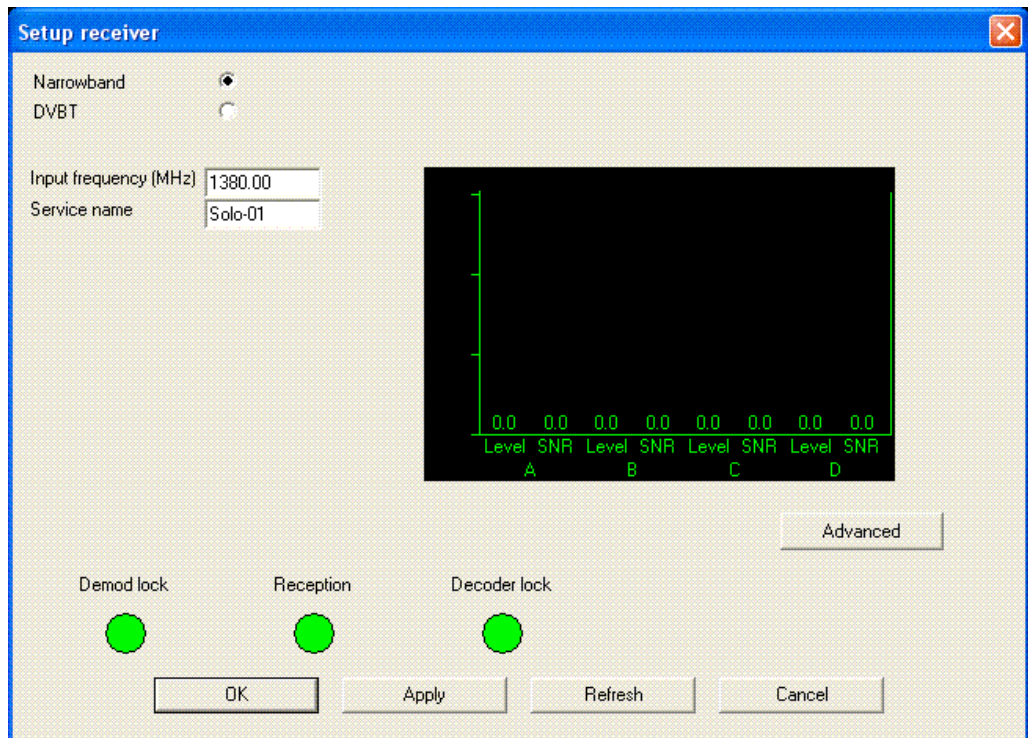
Setup slot 1/Setup slot 2. These options allow the user to control the setup of either input slot and will only appear if there is anything connected to either input slot. The appearance of the options in the menu will depend on the type of unit connected to each input slot – either as “Setup slot N encoder” or “Setup slot N receiver”, where N is the number of the input slot.

The popup window that appears in the case of an encoder will be as follows:



The bitrate which the user can setup will be the total transport stream bitrate. Thus if audio encoding is enabled the available video bitrate will be this total bitrate less the audio bitrate. The rest of the settings are all as detailed in the documentation for the encoder.

The popup window that appears in the case of a receiver is as follows:



The settings for a receiver are all identical to those detailed in the documentation for the receiver.

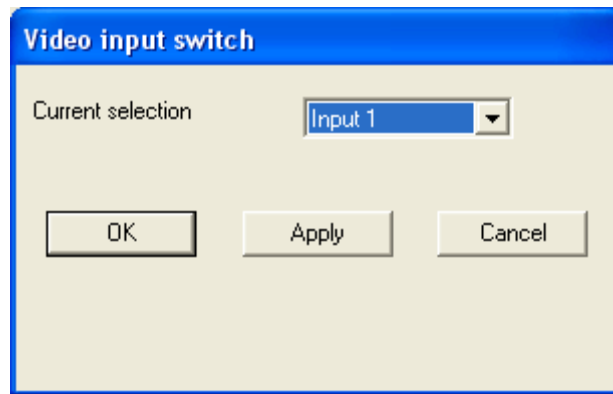
The **Advanced** sub-menu contains the following options:

Send diagnostic commands to inputs/DSP. This is a more advanced option, enabling the user to send diagnostic messages to the Net-Link or to either of the two input slots of a Net-Link. This should only be used when trying to diagnose faults with a Net-Link unit and under the direction of an employee of domo Limited.

Send diagnostic commands to Net-link. This is another advanced option, enabling the user to send commands to the main Net-Link. This should only be used when trying to diagnose faults with a Net-Link unit and under the direction of an employee of domo Limited.

Enable full rate streaming. This option switches the Net-Link unit into full rate streaming mode, suitable for use on local networks. In full rate streaming mode, the Net-Link cannot be controlled from the Net-Link application. Therefore, when this option is selected the application will automatically close down it's connection to the Net-Link. While the full rate stream can be played in the application, subsequent control of the Net-Link must be carried out through the browser control interface.

Video input. This options only appears when the connected Net-Link unit is fitted with a Kramer video switch. A popup window will appear as follows:



The software will read from the video switch the available number of inputs and provide the appropriate selections in the dropdown box.

7.6.2 Local content icon

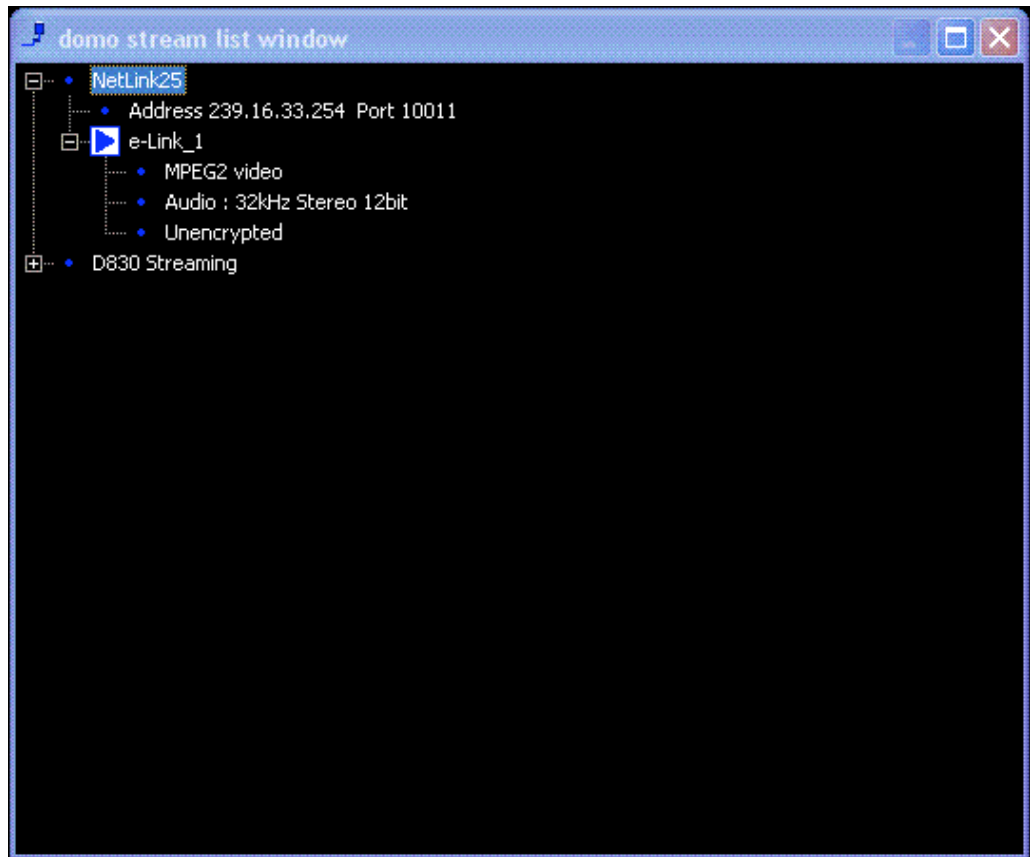


This icon represents locally stored content on the PC. Dropping this icon into a slot will present options for either thumbnails or full frame rate video. Upon clicking one of these options the user will be presented with a window to browse to the location of either the directory for thumbnails or the file for full frame rate video.

7.6.3 Full rate streams icon



This icon represents full rate multicast streams on the local network. Dropping this icon into a slot will bring up a window listing any multicast streams available:



A “play” icon in white and blue appears next to any available services within the streams. In the above screenshot the available service is named “e-Link_1”. Clicking this icon will cause the application to begin playing the service.

7.7 Playback controls area

On the right hand side of the main window is an area which contains a number of buttons to enable the user to control playback of either thumbnails or full frame rate video, or to start and stop recording sessions.

This part of the window always applies to the currently highlighted area of the main workspace. Buttons will be enabled or disabled depending on whether or not their actions can be applied to the current area.

A slider control may also appear as well as text labels and an audio icon relating to playback.

7.7.1 Playback buttons

The actions of these buttons will always be carried out on the workspace area currently highlighted in red. Depending on the contents of the currently active workspace area the icons on these buttons will appear either green (active and ready to use) or grey (disabled).

The actions of the different buttons are as follows:



Play. This button will cause the thumbnails/video to be played at its normal rate. If the thumbnails/video are already playing at normal rate this button will appear disabled.



Pause. This button will pause the playback of the thumbnails/video at the present position.



Stop. This button will stop playback of the thumbnails/video. In contrast to the pause control, this will return the position to the beginning of the recording for when playback is restarted. Also, the display in the workspace area will revert to blue screen.



Increment playback rate. This button will double the rate at which thumbnails/video are played back, up to a maximum of 8 x normal rate.



Decrement playback rate. This button will halve the rate at which thumbnails/video are played back, down to minimum of 1/8 x normal rate.



Single step. This button will put playback into pause mode, if it isn't already, and then advance playback by a single frame or thumbnail each subsequent time it is clicked.



Rewind. This button will only be enabled when playing back previously recorded thumbnails. It will force playback into reverse. Playback can be subsequently returned to normal by using the play button.

7.7.2 Recording buttons



If there is only one connected Net-Link unit, or the currently selected slot of the work area contains a stream from a connected Net-Link unit, the application will send a message to this Net-Link unit to start a recording. Otherwise, if there is more than one connected Net-Link unit, a pop-up window will appear allowing the user to select which unit they wish the recording to be started on.



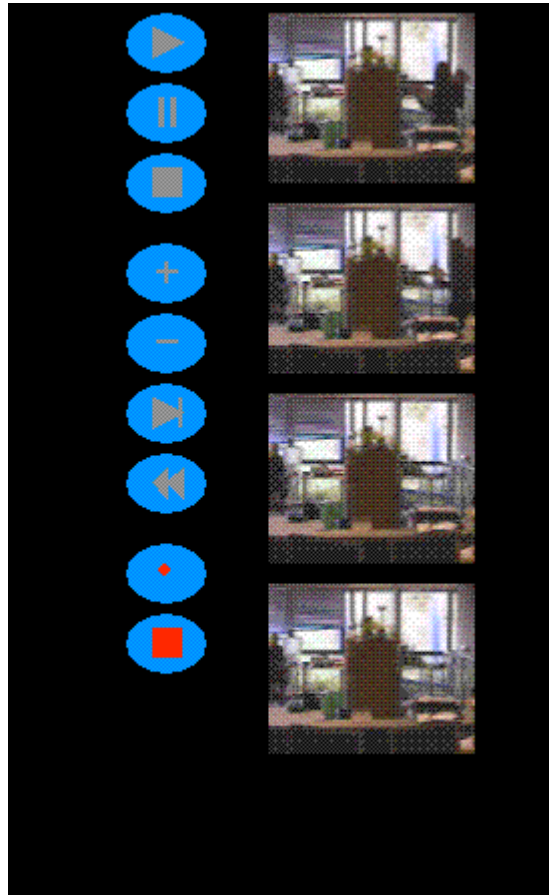
To stop a recording started in this way, the stop recording button on the right hand side of the main window should be clicked.

7.7.3 Slider control

As well as the pushbutton controls, there is a slide bar which appears next to the buttons when playing back previously recorded full rate video or thumbnails. This shows the user the relative position of playback within the recording. When playback is paused, the bar can be dragged to a different position. When playback is resumed it will then continue from this new position.

7.7.4 Thumbnail playback

When playing back thumbnails (whether a live stream or previously recorded thumbnails), a recent thumbnail history will be displayed to the right of the playback controls area:



The number of recent thumbnails being displayed can be altered by going to the “Options” menu and selecting “Thumbnail display options”. Any number of recent thumbnails from 0 to 16 can be selected.

7.8 Toolbar and menus

The following menu options are provided in the Net-Link application.

7.8.1 File menu

New. This option creates a new configuration document.

Open. This option allows the user to open a previously saved configuration. The application will attempt to re-establish any Net-Link connections saved in this configuration file. This will require the user to re-enter their username and password for each connection.

Save. This option will save the current configuration. If the configuration is currently an untitled document, the user will be prompted for a filename and location to save to.

Save as. This option will save the current configuration, always prompting the user for a filename and location.

Exit. This option exits the Net-Link application.

As well as these options, a list of up to four most recently opened configuration files appears.

7.8.2 Edit menu

Recording times. This option enables the user to setup recording times, as previously documented, on any of the current connections.

Set unit time. This option enables the user to setup the real time clock on any currently connected Net-Link units.

Delete recording session. This option enables the user to delete previously recordings on the hard disks of any currently connected Net-Link units.

Change license code. This option enables a new license code for the Net-link application to be entered. This should only be done when a valid new license code is supplied from **domo**.

7.8.3 View menu

Divide grid. This option, when enabled, allows the user to divide the currently selected workspace area into four sub-areas. This option will not appear enabled if dividing into four would lead to sub-areas smaller than the minimum dimensions that the application allows for (100 x 122 pixels).

Undivide grid. This option, when enabled, allows the user to return from four sub-areas to one larger area. If there is only content in one of the four sub-areas, then this content will appear in the larger area after the division has been broken. If there is content in more than one of the sub-areas, then the content from the currently selected area will appear in the larger area, with the content of the other areas destroyed.

Toolbar. This option allows the user to toggle whether or not the application toolbar is visible.

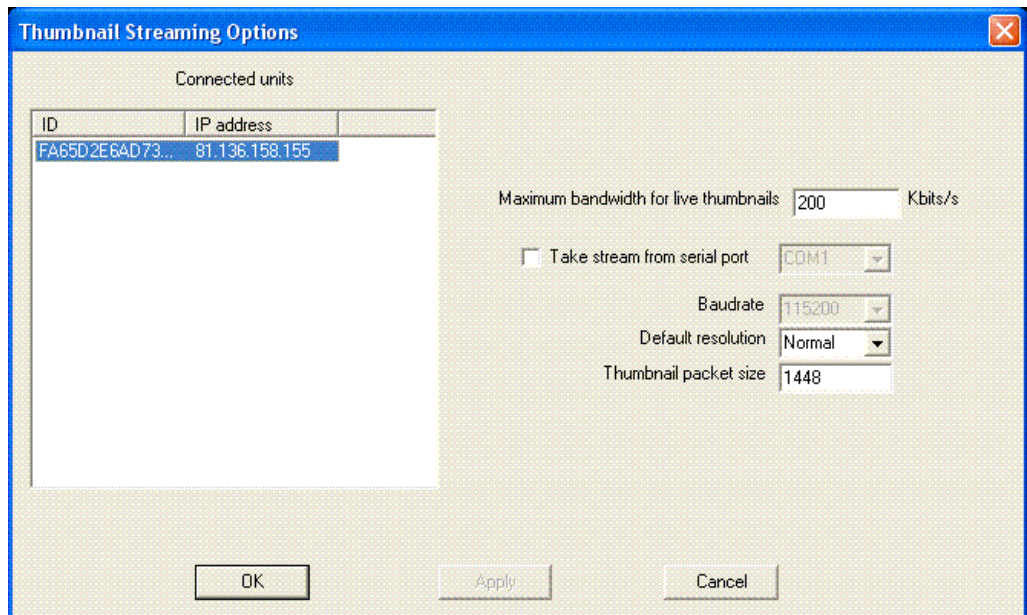
Status bar. This option allows the user to toggle whether or not the application status bar is visible.

7.8.4 Options menu

Autoloop file playback. This option allows the user to toggle whether or not recordings being played back will automatically loop back to the beginning when the end of the recording is reached.

Thumbnail display options. This option allows the user to select the number of recent thumbnails to display in the playback controls area of the application.

Thumbnail stream options. This option allows the user to setup various features of thumbnail streaming. A popup window will appear as follows:



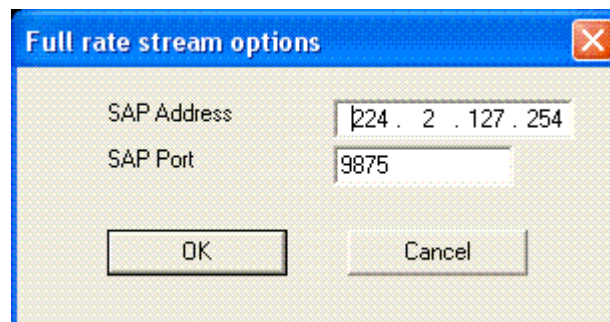
Setting a maximum bandwidth for the thumbnails is useful for occasions when a Net-Link unit does not have a large bandwidth available for streaming. Limiting the bandwidth will prevent the Net-Link unit trying to flood a limited connection with too much information.

The option to take a stream from the serial port is for specialist applications when a stream can be fed into a computer through a serial port. The baudrate setting is also used for this purpose. These options should not normally be used.

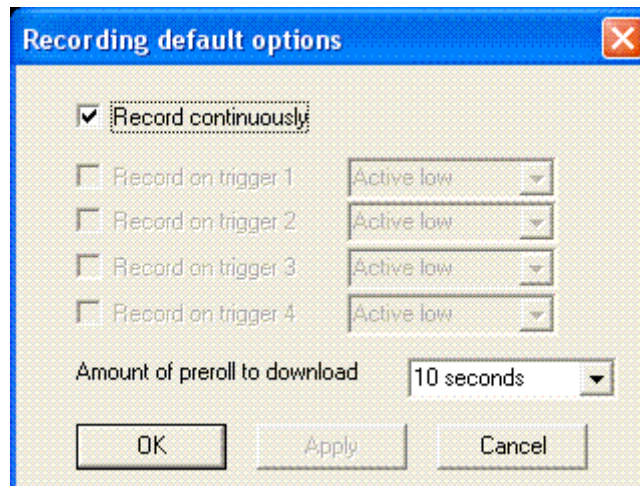
The default resolution can be set to either "Normal" or "Reduced". Normal resolution will be 288 line thumbnail images for a PAL video source or 240 line images for an NTSC video source. Reduced resolution will be 144 line thumbnail images for a PAL source or 120 line images for an NTSC source.

The thumbnail packet size can help in producing an optimum transmission bandwidth. The default value of 1448 bytes is normally sufficient.

Full rate stream options. This option allows the user to change the address and port number being scanned for announcements about full rate streams available on the local network. A popup window will appear as follows:



Recording options. This option allows the user to setup various default features of recording. A popup window will appear as follows:



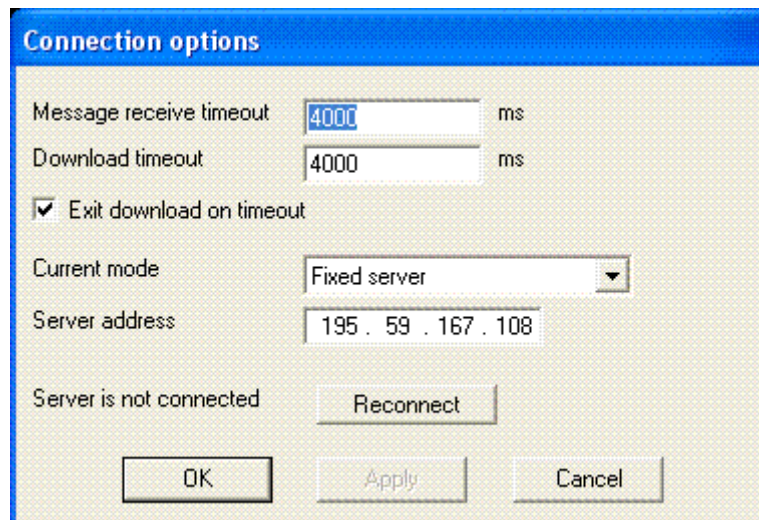
Recording can be setup either continuously or to record on active high or active low of different triggers. When retrieving recordings that have been activated by triggers the amount of preroll recording to download can be setup here. This can be set to either 10, 20 or 30 seconds.

Unit hard disk status. This option allows the user to see the hard disk capacity and current occupancy on any currently connected Net-link units.

Create new connection. This option allows the user to create a new connection to a Net-link unit, as documented earlier.

Logging options. This option allows the user to select what information is written to the applications log file. It should not normally be necessary to alter these settings.

Connection options. This option allows the user to alter various settings related to how the Net-Link application connects to Net-Link units. A popup window will appear as follows:



The "Message receive timeout" field specifies how long the application will wait for a reply to each message it sends to a Net-Link unit. The user may wish to set this to a longer timeout when latency is higher between the application and the unit.

The "Download timeout" field specifies how long the application will wait without receiving any further part of a download before it automatically exits the download. Also, the "Exit download on timeout" option, when

checked, specifies whether the application will automatically exit from a download at all.

The remaining settings, for operation mode are described in section 5.2 of this handbook.










7.8.5 Help menu

Help topics. This option brings up a window with information to help the user use the application.

About. This option brings up a popup window displaying version and copyright information as well as the applications serial number for the computer it is installed on. This serial number is needed when contacting **domo** for a new license code.

7.8.6 Toolbar buttons

The toolbar provides buttons as shortcuts to some of the menu options:

-  This provides a shortcut to the “New” option in the “File” menu.
-  This provides a shortcut to the “Open” option in the “File” menu.
-  This provides a shortcut to the “Save” option in the “File” menu.
-  This provides a shortcut to the “Divide” option in the “View” menu.
-  This provides a shortcut to the “Undivide” option in the “View” menu.
-  This provides a shortcut to the “Delete recording session” option in the “Edit” menu.
-  This provides a shortcut to the “Unit hard disk status” option in the “Options” menu.
-  This provides a shortcut to the “Create new connection” option in the “Options” menu.
-  This provides a shortcut to the “About” option in the “Help” menu.

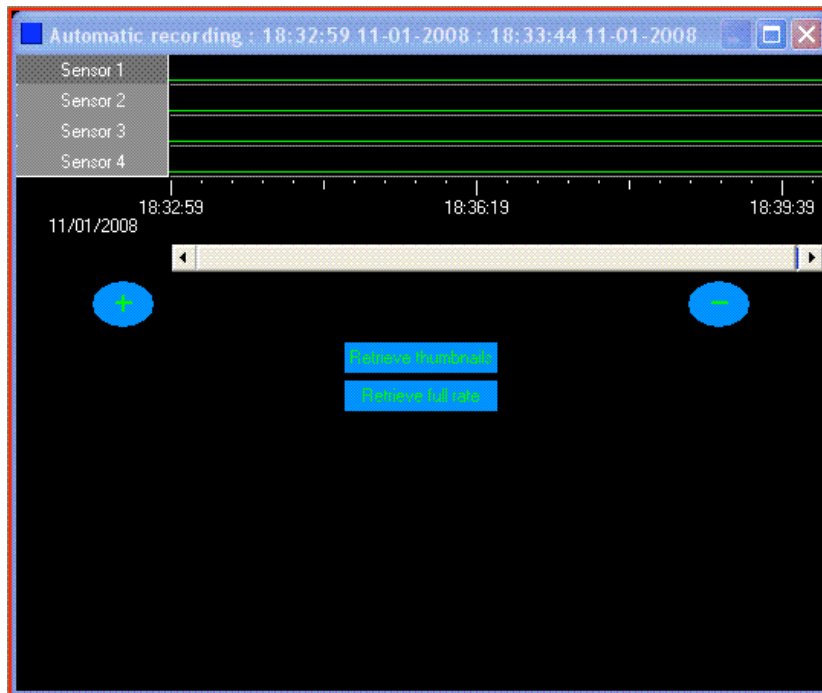
8 Retrieving stored content

When the connection icon has been dropped into the workspace area and the stored content option selected, a new window should appear similar to the following, showing content stored on the Net-Link unit's hard disk:

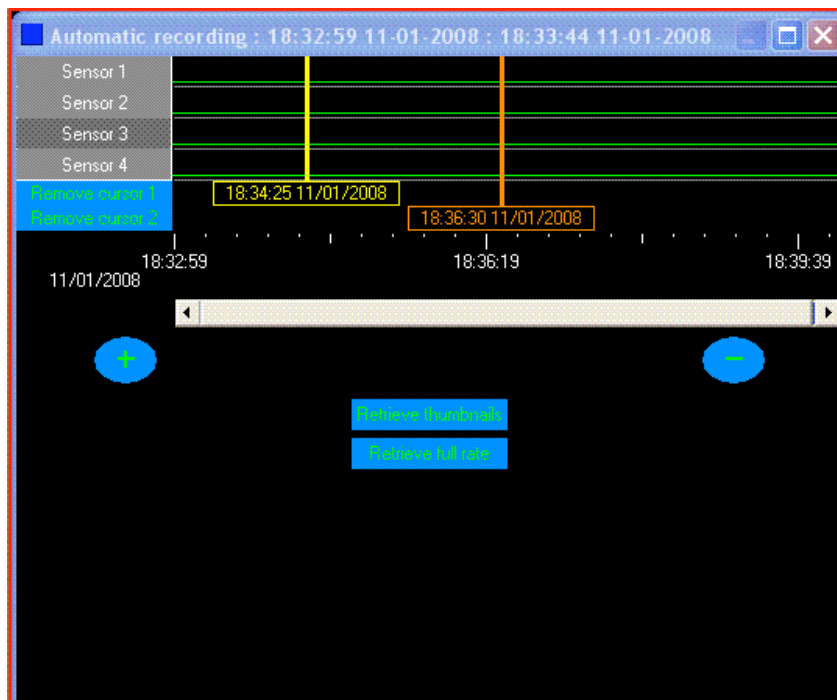


This gives the title of each recording, along with boxes containing its beginning and ending times and dates. These times and dates can be adjusted using the arrow controls on the side of these boxes or by highlighting a box and directly typing the desired time/date. In this way the user can specify the exact portion of the recording which they wish to download. All the user needs to then do is click either the "Thumbnails" or the "Full rate" button to the right of the time/date controls and the application will begin the download. When the download is complete a window will appear playing back the retrieved recording.

If the user selects the "Triggers" button for a recording, a further window will appear showing a graph of any trigger activity that has occurred during the recording:



Clicking on this graph will bring up cursors which can be positioned to set the part of the recording the user wishes to download:



These cursors can be clicked and dragged along the recording timeline. Buttons labeled “+” and “-” allow the user to zoom in or out of the graph respectively.

The type of content to download is specified by clicking either the “Retrieve thumbnails” or “Retrieve full rate” buttons.

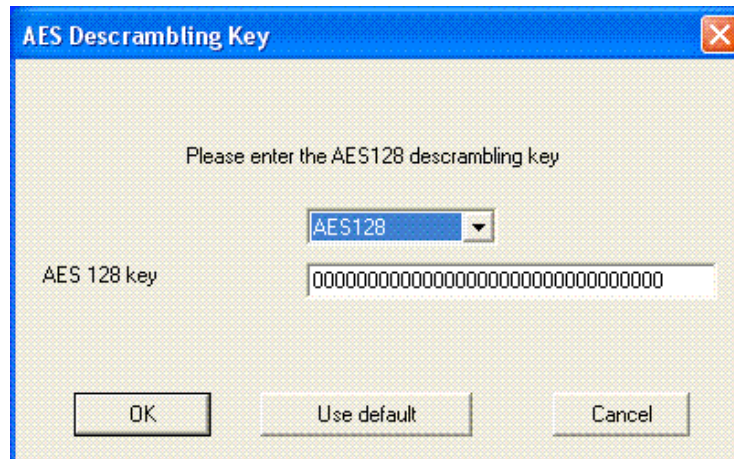
By default all recordings will be downloaded into temporary files on the local computer, which will then be removed later by the software. Should the user wish to store the recording to a more permanent file/directory on the local machine, the "Store permanently" checkbox to the right of the "Thumbnails" button should be checked. Before the download commences the user will be presented with a pop-up browse window to

select a directory for the thumbnails to be stored to or a file for the full frame rate video.



9 Decryption keys

All Net-Link products are set up initially to encrypt all content using the AES standard. 128-bit or 256-bit keys may be used. When playing back content a pop-up window will appear prompting for a decryption key:



With the default setup, the user should simply click the "Use default" button on this pop-up window for the application to begin decrypting and playing back the thumbnails/full frame rate video. Otherwise the user should select the appropriate decryption type (AES128 or AES256) and enter the correct key.

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