LFM

LFM NetView

V1.00.0.0

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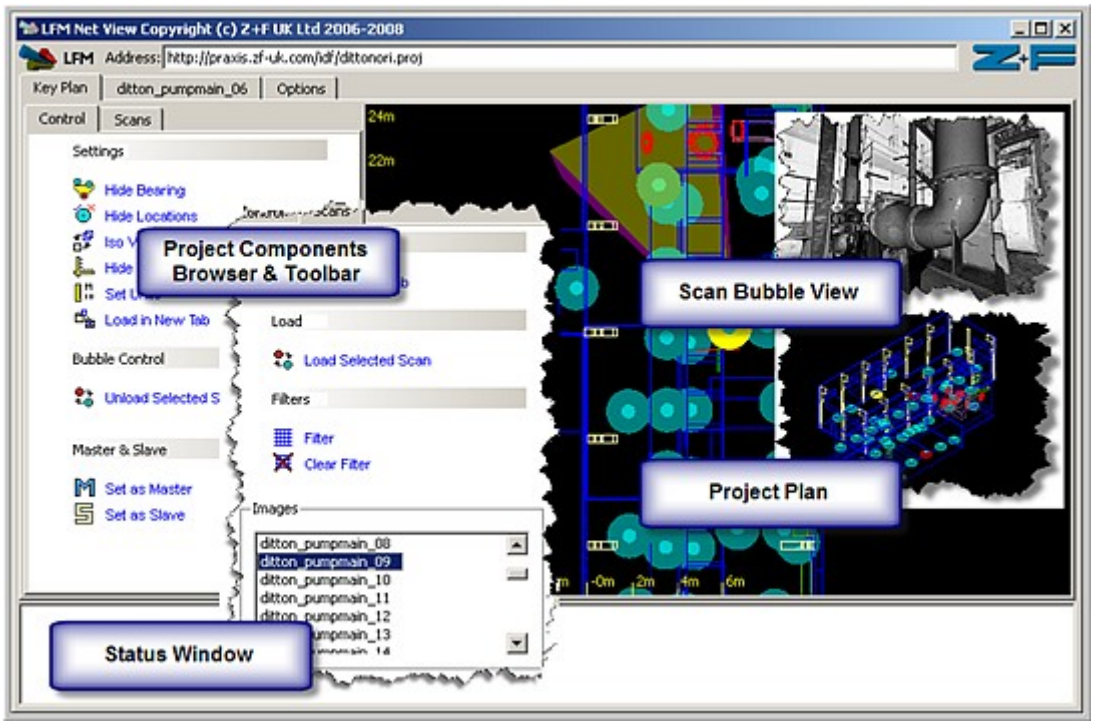


1.1 Overview

The growing trend to upgrade existing plant, rather than new build, has focused attention on engineering data capture in general, and has swept laser data capture into the mainstream. Competitive pressures to reduce costs and improve efficiency, have further fuelled the uptake of laser scanning. Laser scanning has therefore become a well established technique which is known to greatly reduce project timescales by reducing errors, improving site safety and by limiting the number of visits made to site.

To date however, only limited use of these laser scan data has been made in the field of Asset Management. One key issue for Asset management is to have very rapid access to data from anywhere in the world. Net-View bridges this gap. It will enable the user scan data to be used more readily throughout the life cycle of an asset. The data will be used by service providers, EPC's and Owner Operators. Value will be seen by designers, managers and operators.

NetView is a free Web Browser plug-in and also an application which enables secure access of LFM Server databases via the Internet. It uses data streaming technology to present instant bubbles. It's security is ensured by use of password protection and data encryption. **It is extremely intuitive to use requiring little, or no, training**.

NetView frees the user from the need to carry around sensitive databases.

Extensive mark-up and measurement facilities can be found in LFM NetView. These facilities enable the user to measure points, distances, widths, pipe diameters and pipe spacings and also to highlight regions of interest.

NetView allows multi-user reviews. This feature is available uniquely within the NetView environment and enables users in different offices to carry out interactive, collaborative, project reviews: including joint mark-up and measurement.

NetView provides an integrated, detailed, 3-D plan of the site showing the precise locations of each of the scans and from this, can select any scan or multiple scan bubbles to be loaded on demand. Once loaded, each scan is presented as a Bubble through which the user can fly.

The tools used in the development of NetView enable ready integration with other asset management software. For example AVEVA VNET. AVEVA are a leading provider of plant design and engineering life-cycle solutions. The field of Engineering Asset Management is complex and the laser scan data is a small component . This is why NetView has been closely integrated with the AVEVA VNET system to form part of the much larger picture needed by asset management teams.

1.2 LFM Net-View - Key Features

- Internet based Bubble Viewer
    - Remote connection to any LFM Server database.
    - Plan View
    - Multiple Bubble Views
- Multi-user Review sessions
    - Master Slave operation
- Extensive measurement features
    - Point
    - Distance
    - Width *
    - Diameter *
- Extensive mark-up facilities
    - Comment Box
    - Area of Interest
- Can read most panoramic formats
- AVEVA VNET integration

* Future release

Notes

2.0 Tutorial

2.1 Overview – How do I?

LFM NetView is not a difficult software package to use. The laser scanned data is presented in a clear and intuitive way. This document should contain all the information to get you started, but clients should also read the detailed documentation supplied with LFM Server, which relates to the creation and hosting of a NetView project database. Z+F-UK will be happy to offer support in the configuration and use of the software for new users.

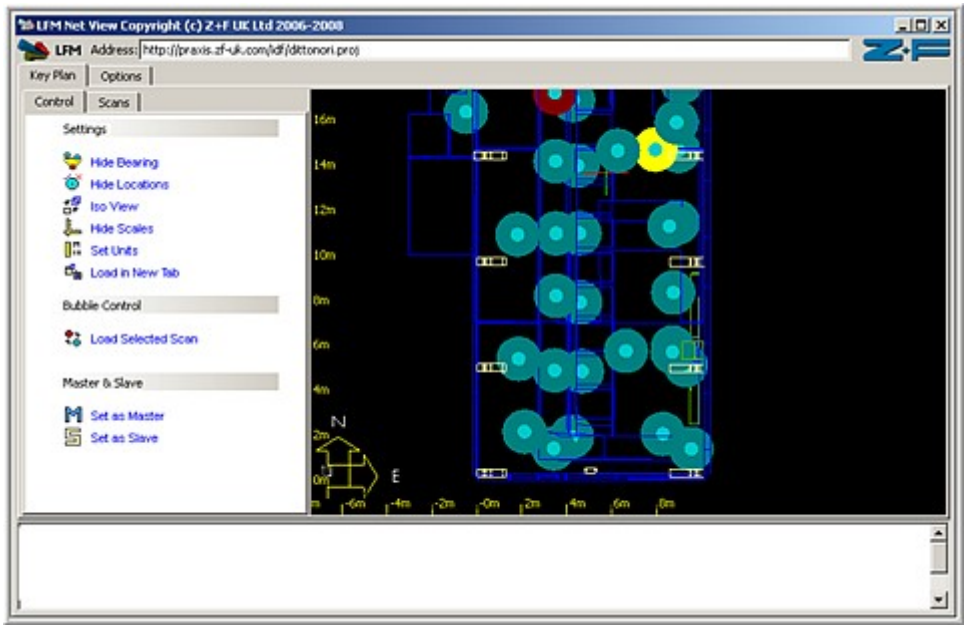
Z+F-UK will provide upon request, a short course to aid the understanding of the system which will cover the basic functionality, flight control, and initial configuration. This may be desirable when users have had no previous exposure to laser scanned data. The course usually takes between two and six hours depending on previous experience.

Please contact support.vision@zf-uk.com for details.

This tutorial section is not intended to cover every aspect of this package, but should allow designers with CAD backgrounds a quick introduction to common features, and typical project requirements.

2.2 Open a project

Projects are loaded into LFM NetView in a similar way to which web pages are loaded into your web browser. To load a project enter the URL of the project into the address bar and press the enter key. A useful alternative to entering the same URL every time you load LFM NetView is to specify a default URL on the ***options*** tab.



Once the enter key has been pressed, LFM NetView will start to download the project. If the server on which your project is located requires a username and password, a window may pop-up prompting you to enter your username and password, before the download can continue. This will also occur if a non default project is selected in a NetView session.
Once fully downloaded, the key plan tab will change to show your project as illustrated.

Any errors will be displayed in the status box at the bottom of the window.

On the left there will now be a side-bar containing a further two tabs entitled ***Control*** and ***Scans*** these tabs contain a number of options and tools. On the right of the tab, a plan of your project with the locations of each scan will be displayed.

2.3 Navigating using the key plan

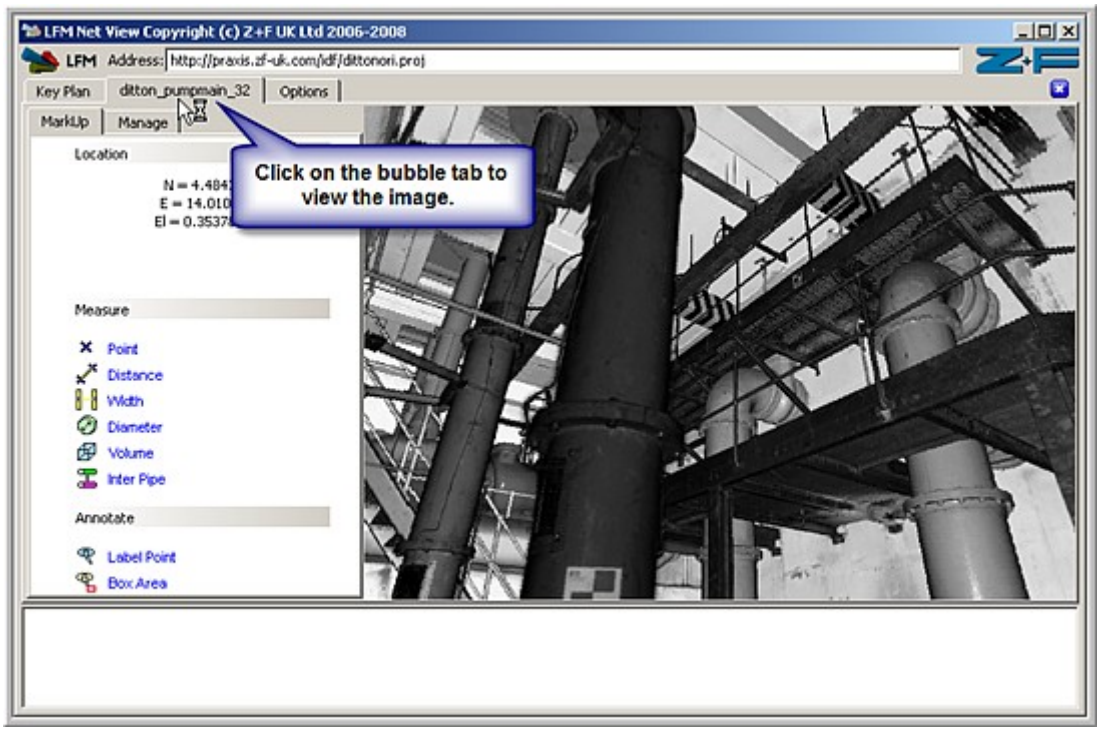
The key-plan provides a plan of the scan area together, if selected, with the location of each scan. The showing of the location of scans can be toggled using the ***Show Locations/Hide Locations*** button on the side bar. If shown, scans are coloured differently depending on whether they are loaded or not. Unloaded scans are coloured blue, whilst loaded scans are coloured red. The currently selected scan is coloured yellow irrespective of whether or not it is loaded. A scan can be selected by clicking on it in the key plan with your left mouse button. For loaded scans, a view-frustum can be toggled using the ***Show Bearing/Hide Bearing*** button on the side-bar. When displayed, view-frustums show the direction that each loaded scan is looking in and how much is visible in the scan.

The key-plan provides two different views, an isometric view and a plan view. To switch between these either press the ***Ctrl*** key or toggle the ***Iso View/Plan View*** button on the side bar.

It is possible to navigate around the key plan using your mouse. To pan around the key-plan hold down the left mouse button over the plan and move your mouse around. You can zoom in on a feature of the key plan by rotating your mouse wheel forwards. To zoom back out rotate the wheel backwards.

2.4 Selecting and loading a bubble view

LFM NetView allows multiple scans to be loaded at once. There are three ways to load a scan in LFM NetView. Firstly, a scan can be loaded by right clicking on it on the key plan and selecting the Load bubble option from the pop-up menu. Alternatively, a scan can be loaded by clicking on the ***Scans*** tab on the side bar and selecting the scan name from the ***Images*** list and double clicking on it. Finally, the currently selected scan can be loaded by clicking the ***Load Selected Scan*** option in the side bar.



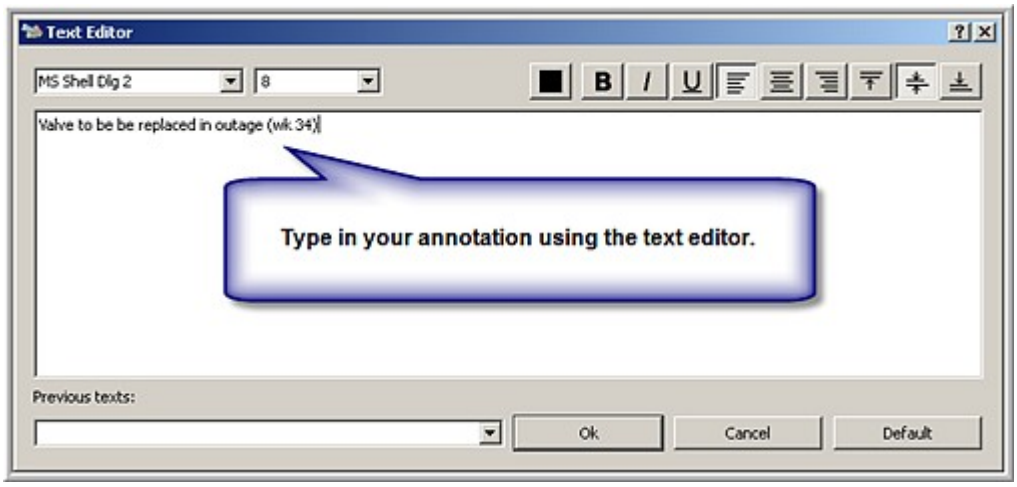
When a bubble has successfully started to download, a new tab is created in the top level tab bar. To display the bubble, click on this tab. When the bubble has downloaded the window will resemble the following illustration.

The bubble's tab contains a second side bar on the left with two tabs entitled ***Mark Up*** and ***Manage***. The *Mark Up* tab displays various tools to add and edit annotations and to make measurements in the scan bubble. The *Manage* tab displays options to toggle the display of various mark-ups on or off. The bubble is displayed on the right of the tab.

2.5 Making annotations

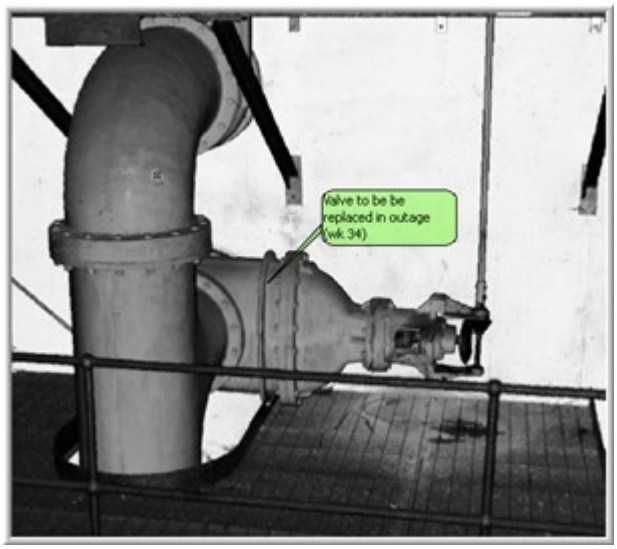
LFM NetView has three types of annotation; a label point to annotate a specific point, a box area to highlight a rectangular area, or a lasso area to label a user-defined area.

Making a Label Point Annotation



To make a label point annotation, first click on the ***Label Point*** icon on the bubble's *Mark Up* tab. When moving the mouse pointer over the bubble area, your mouse pointer will now change to a cross. To select a point simply click the left mouse button whilst hovering over it.

When the left mouse button is clicked, a new window as illustrated above will appear requesting that you enter a label for the annotation.

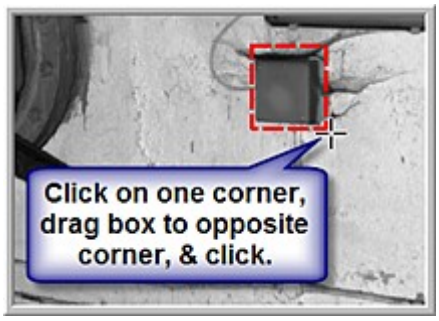


The window gives a number of options to format your label. Once you are happy with your label, click the ***Ok*** button. Clicking ***Cancel*** on the window, or pressing the Escape key at any time, will cancel the addition of the annotation.

When you click the ***Ok*** button, the annotation will be displayed in the bubble, as illustrated and stored in the project database.

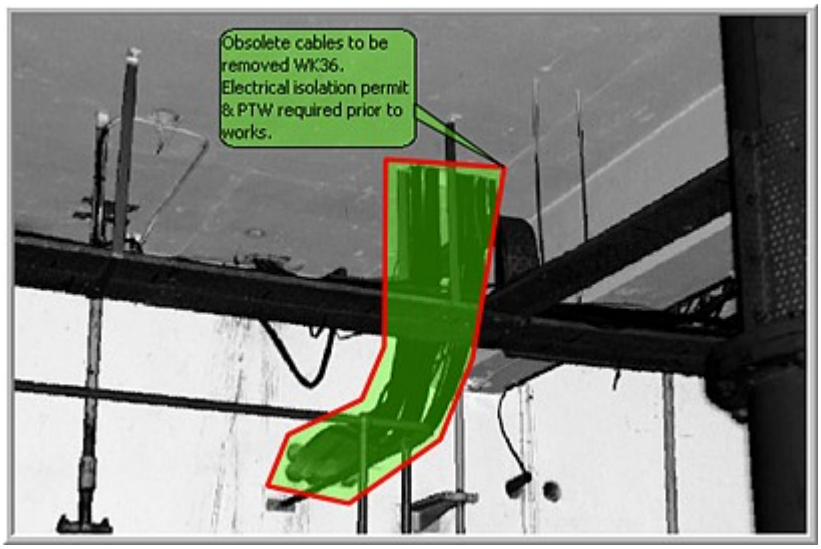
Box Area Annotation

This function allows the creation of scan annotation boxes. Open a scan, click & hold on one corner of the desired box, move the mouse, and a box will then appear that can be dragged to the desired position. Close off with a mouse click. A dotted red line is displayed to aid the selection.



After the second corner is clicked, a text editor will appear on the screen, which enables the user to add the necessary notation. Text font, size, style and justification are all editable. Alternatively, the user can choose to add stored previously used text.

Making a Lasso Area Annotation



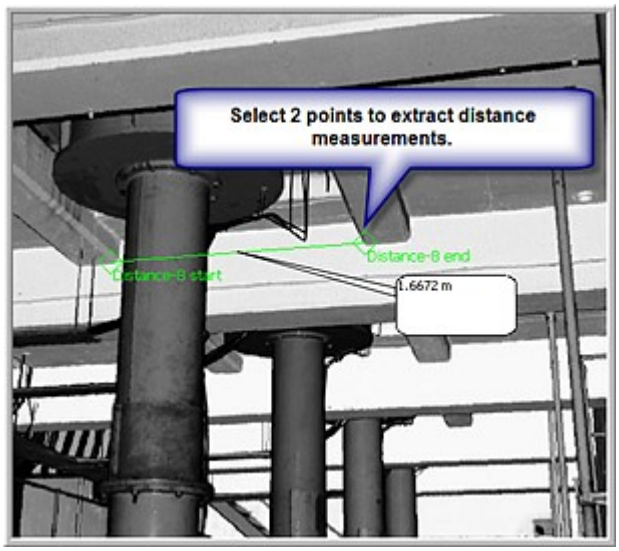
A lasso area annotation allows you to make an annotation about a user-defined area of a scan. To make a lasso area annotation, first click the ***Lasso Area*** button on the bubble's *Mark Up* tab. A lasso area can be define by clicking the left mouse button on a number of points around the scan which correspond with the corners of the area which you wish to annotate. A lasso area is completed by clicking the right mouse button.

Once the right mouse button is clicked, a window appears where you can enter a label for the annotation. This window operates in a manner similar to the label point and box area annotations.

When you click ***Ok*** on the text editor window the lasso area annotation and label will be displayed on screen, as illustrated, and saved in the project database for later retrieval.

2.6 Take measurements

To make a distance measurement, first click on the ***Distance*** icon on the bubble's *Mark Up* tab. When moving the mouse pointer over the bubble area, your mouse pointer will now change to a cross. To select the start point for the measurement simply click the left mouse button whilst hovering over it.
LFM NetView will now retrieve the selected points details from LFM Server, and will display a yellow line attached to your first point that will follow the mouse pointer around. Repeat the process to select the end point of your measurement. Once the end point is selected, LFM NetView will display a green line between the two points. Depending on how fast your Internet connection is, it may take a few moments to retrieve the distance measurement from LFM Server.

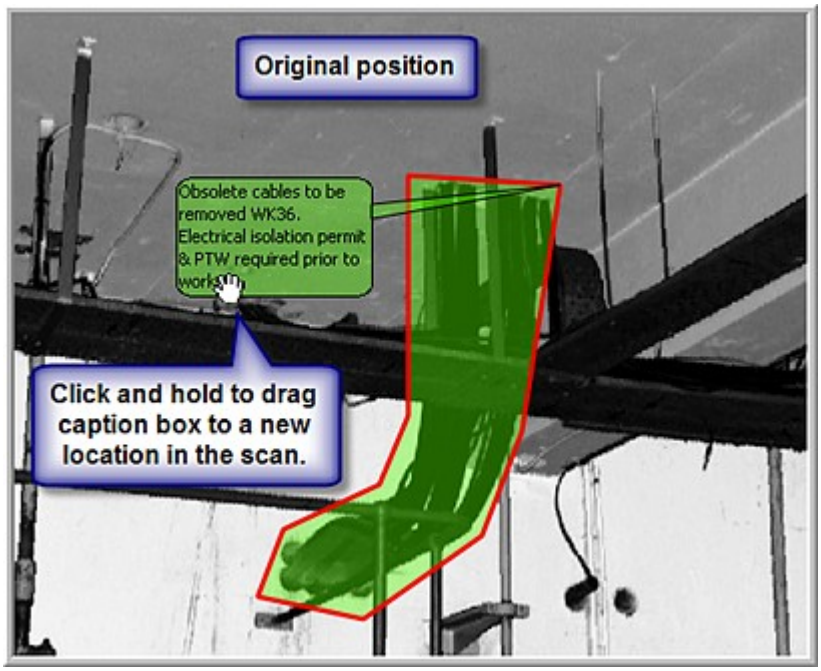


Measuring a Distance

Once the distance measurement has been successfully retrieved from LFM Server, it will be displayed on screen as illustrated. LFM NetView will then automatically save the measurement for future retrieval in the project database.

2.7 Moving a mark-up label

Occasionally, the label associated with an annotation or measurement may obscure part of the scan or a piece of mark up which you wish to look at. It is possible to move such a label using the ***Move*** button on the *Mark Up* tab of the side bar. To move a label, firstly click the ***Move*** button on the *Mark Up* tab. Now select the label that you wish to move by holding down, but not releasing, the left mouse button whilst hovering over the label. Next drag the label to the new position where you wish it to be located, and let go of the left mouse button. The label will now be moved to the new location, and in the case of annotations this will be saved to the project database for future retrieval.



To cancel a move at any time before releasing the mouse button press the escape key. A move can also be cancelled before selecting a label by clicking in an area of the scan where there is no mark up or by selecting another option from the *Mark Up* tab.

2.8 Removing a Measurement or Annotation

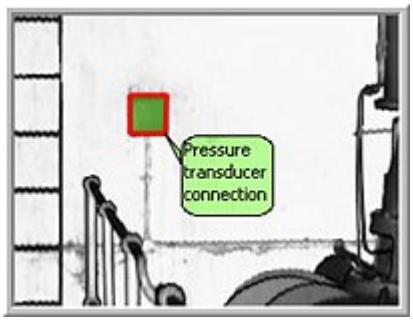
Both annotations and measurements can be deleted from a scan. When a mark up is deleted, it is removed from the project database and will be lost forever. To delete a measurement or annotation, simply click on

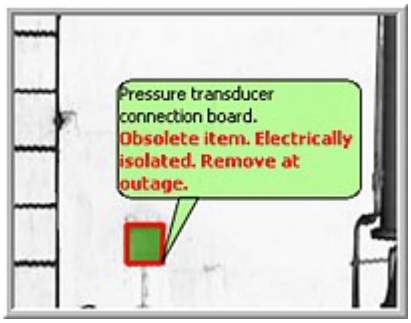
the ***Delete*** button on the *Mark Up* tab of the side bar. When moving the mouse pointer over the bubble area, your mouse pointer will now change to a cross. To select an annotation or measurement to delete, press the left mouse button whilst hovering the mouse pointer over the speech bubble label associated with the mark-up. The label and any other mark up associated with the annotation or measurement will then disappear and be deleted from the project database.

If you change your mind about deleting before selecting a label, the delete option can be cancelled by any one of pressing the Escape key, clicking in an area of the scan with no mark up or selecting another option from the Mark Up tab.

2.9 Modifying a Mark Up Label

LFM NetView allows you to modify the text in an annotation label. To do this, select the ***Modify*** button from the *Mark Up* tab on the side bar. Next select the label that you wish to modify by clicking the left mouse button whilst hovering over the label. A text editor window will appear containing the text that is currently contained in the label. The text for the label can now be edited in a similar way to which it was first created. To complete the modification, press the ***Ok*** button on the text editor window. The modification is now made to the annotation on screen and saved to the project database.





A modification can be cancelled at any time before the ***Ok*** button is pressed by pressing the Escape key. A modification can be cancelled before a point is selected by clicking in an area of the scan with no mark up or selecting another option from the *Mark Up* tab. Finally, a modification can be cancelled in the text editor by pressing the ***Cancel*** button. It should be noted that only the user who originally made an annotation can modify it. As measurements are made by LFM NetView itself, no one can modify the text contained in the label of a measurement.

2.10 Master - Slave Mode

Master & slave mode allows people to host open forums when reviewing data. Potentially, several offices can review the project data in detail as directed by the session 'Master'. Any annotations or measurements taken by the session host will appear on any of the 'Slave' desktops in real time. This system is invaluable in sharing data with design teams or asset owners in globally diverse locations; only requiring web access for all participants and a conference telephone call for voice overs.

To direct using this facility, one must first select the '*Set as Master Mode*' button, and assign a name for the person hosting the web session.

Note: Once the session has ended, please select '*Turn off Master Mode*' to become invisible to other web users.

Review session attendees (Slaves)

When a user wishes to join a web based review session, '*Set as Slave*' must be selected.

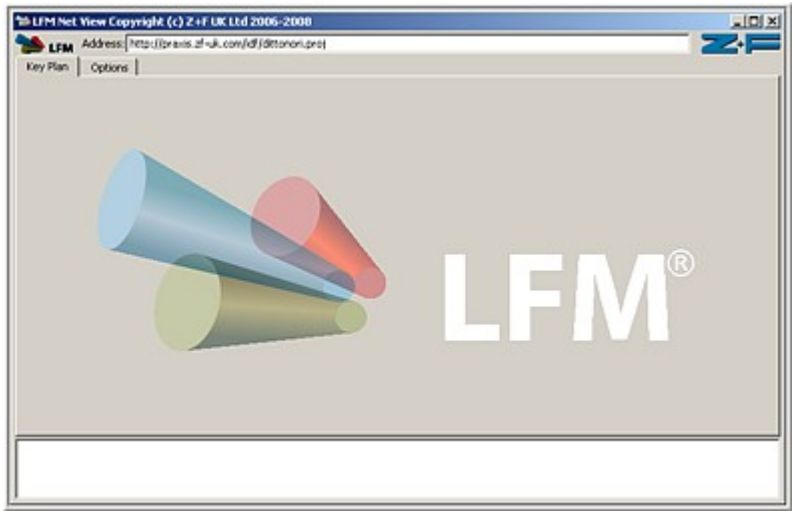
All participants wishing to join the review must select a group *master* from the displayed list.

Note: On busy projects, there may be several sets of people accessing the data simultaneously. Care must be taken to join the correct session.

Additionally, all data shared across the internet is encrypted.

Once the session has ended, please select '*Turn off Slave Mode*'.

3.0 Opening a NetView Session



3.1 Overview

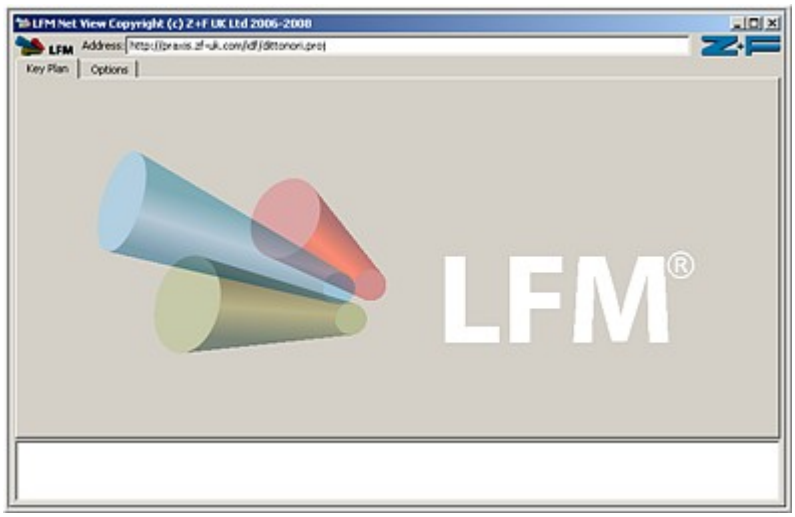
Projects are loaded into LFM NetView in a similar way to which web pages are loaded into your web browser. To load a project, enter the URL of the project into the address bar and press the enter key. Once a project is loaded on the screen, A series of tabs can selected to show all current windows available to the user. Images can be loaded directly from the browser, measurement and annotation tools accessed, and information displayed about items of interest.

3.2 Start up

LFM NetView can be started from the or directly from the '*MS Windows - start menu*', or the LFM NetView desktop shortcut.

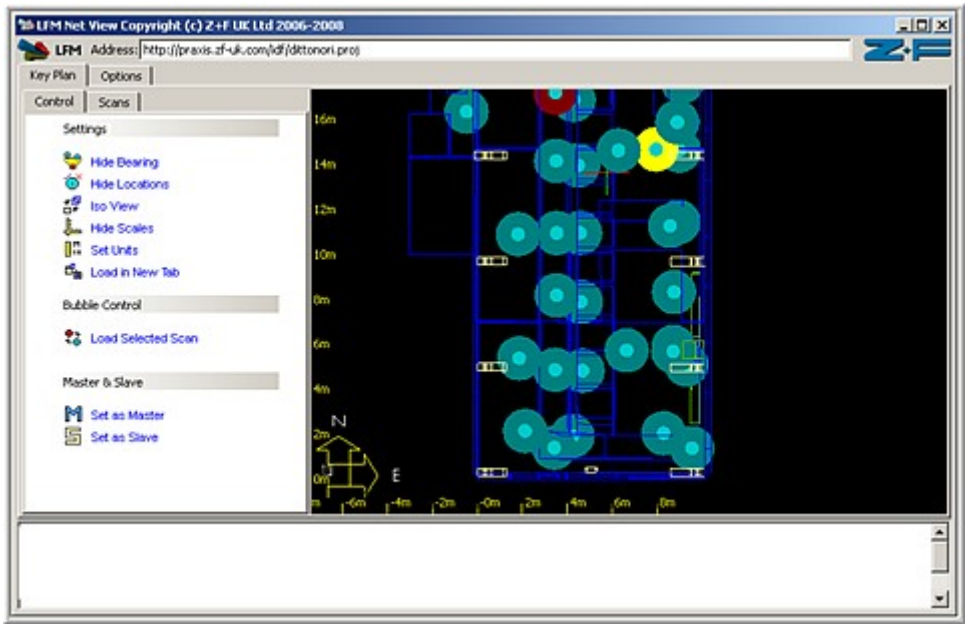
The NetView browser will appear on screen. If NetView has been configured to work with a specific project, the address bar will display the project URL. If this is correct, press <rtn> (after clicking in the address bar with the cursor). If the user wishes to view a different project, simply type in a new URL in the address bar to open the desired database.

Please read NetView - Options (section 5.7) to customise the loading project preferences.



Once the enter key has been pressed, LFM NetView will start to download the project. If the server on which your project is located requires a username and password, a window may pop-up prompting you to enter your username and password, before the download can continue. Once fully downloaded, the key plan tab will change to show your project as illustrated. Any errors will be displayed in the output box at the bottom of the window.

When the project opens, the user will see the plan view of the project.



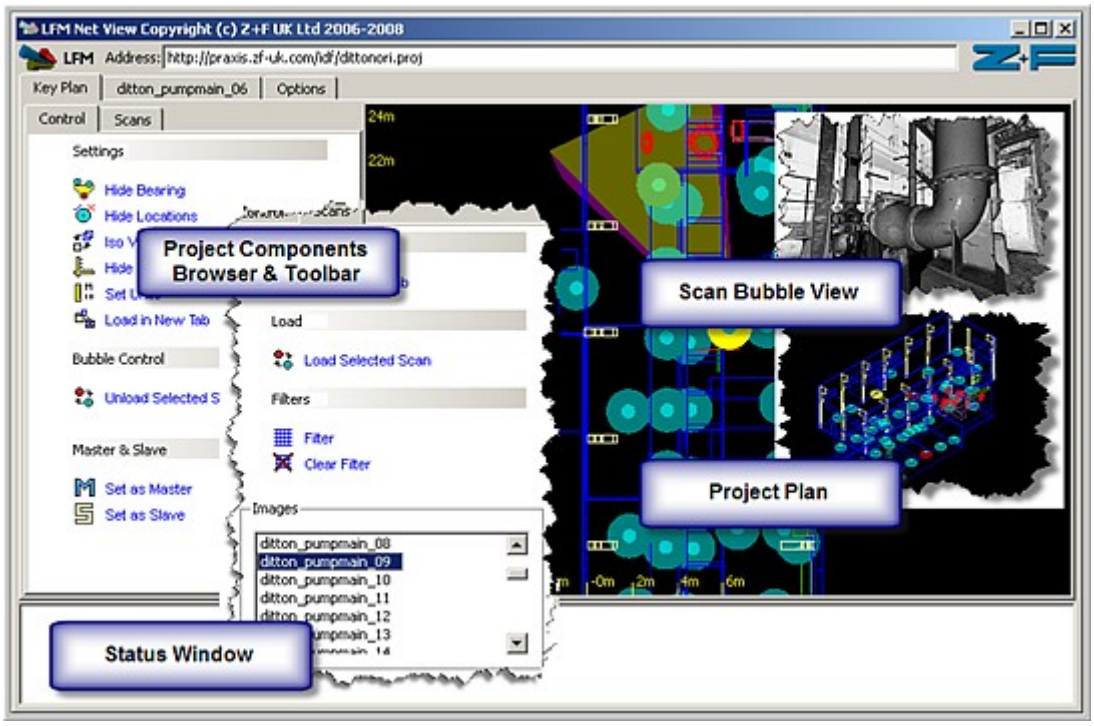
On the left there will now be a side-bar containing a further two tabs entitled '*Control'* and '*Scans'*, these tabs contain a number of options and tools. On the right of the tab, a plan of your project with the locations of each scan will be displayed.

Please read the relevant areas of this help file for specific information about the following topics:

- Load a Scan
- Scan Navigation
- Plan Display
- Using Measurement & Annotation Tools
- User Preferences

Notes

4.0 Interface Overview and GUI Look-up

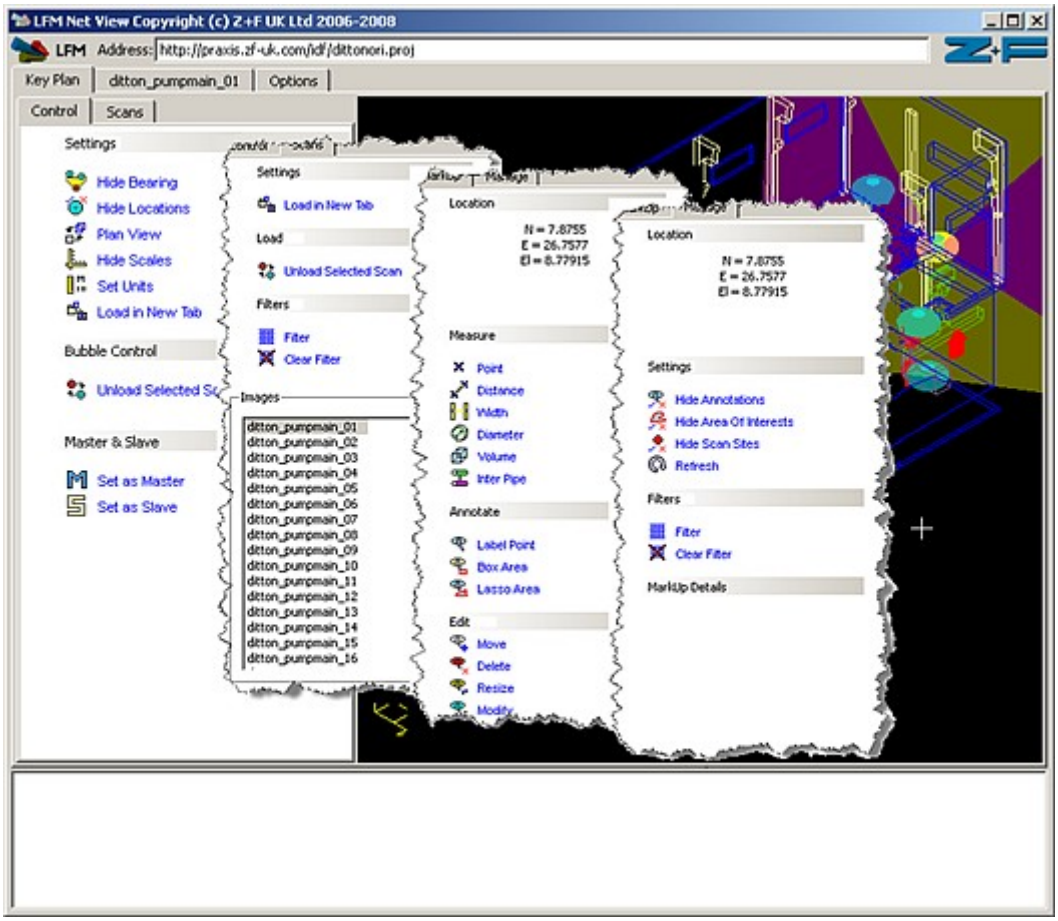


The graphical user interface comprises four main areas:

- **Project Components Browser & Toolbar**
- **Bubble View Windows**
- **Project Plan Display**
- **Status Window**

Notes

5.0 Project Components Browser & Toolbar



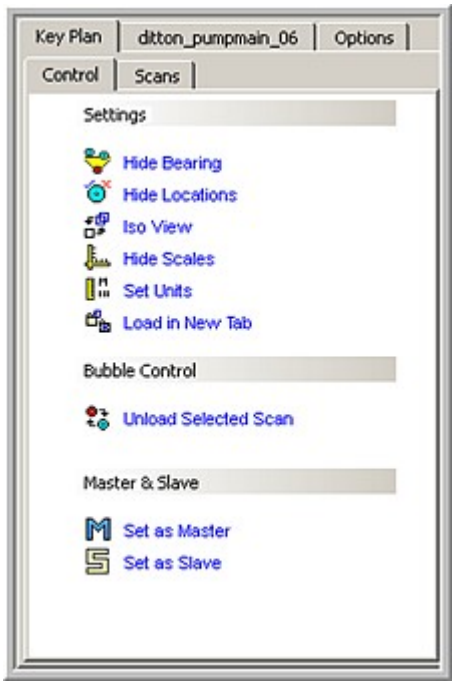
5.1 Overview

The Project Components Browser & Toolbar contains links to the various scans, annotations, and plans displayed on the LFM Net-View desktop. A series of tabs can selected to show all current windows available to the user. Images can be loaded directly from the browser, measurement and annotation tools accessed, and information displayed about items of interest.

5.2 Components Browser

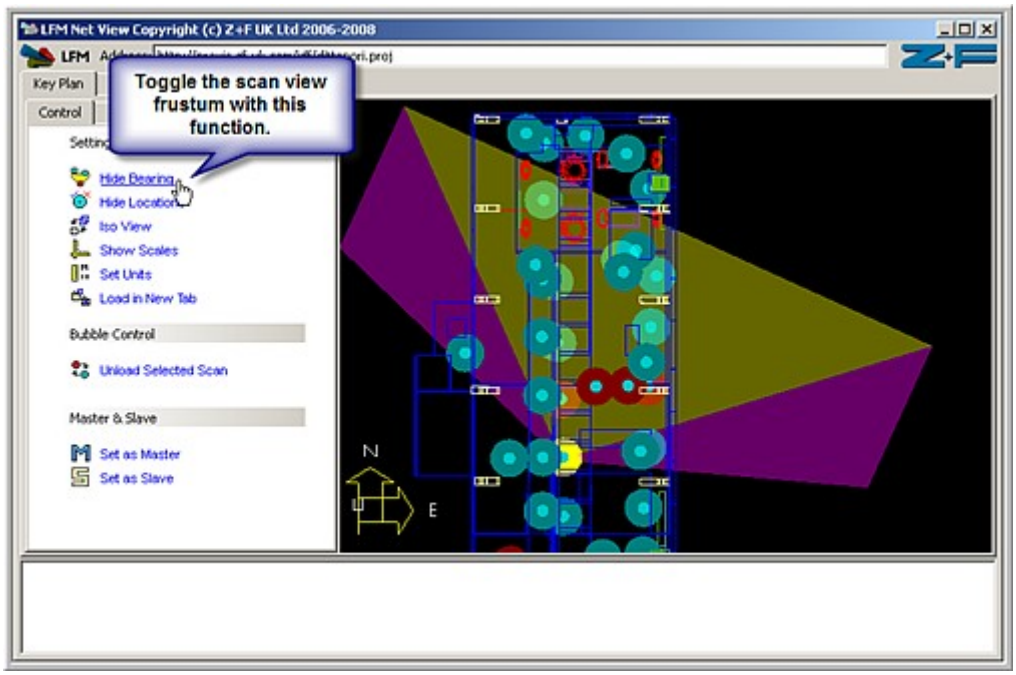
The Components Browser window (shown in previous illustration) shows the current state of all windows relating to an active project. The browser takes the form of a tabbed notebook, with each tabbed page corresponding to a different window or function. As images are loaded or unloaded, tabs appear or disappear at the top of the browser.

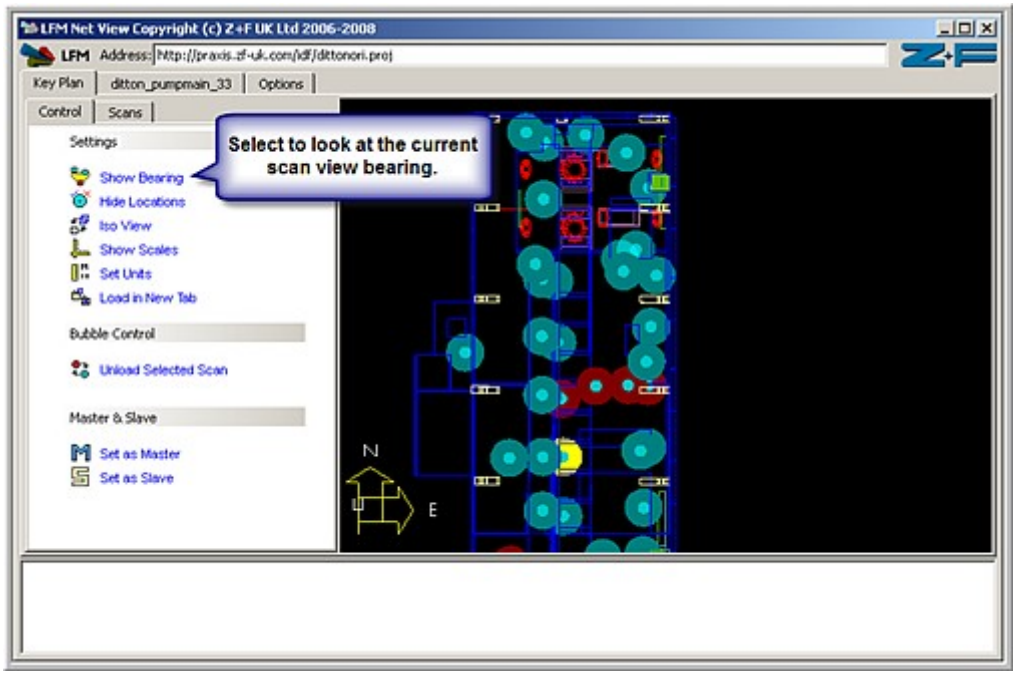
5.3 Control Tab



5.3.1 Bearing Display

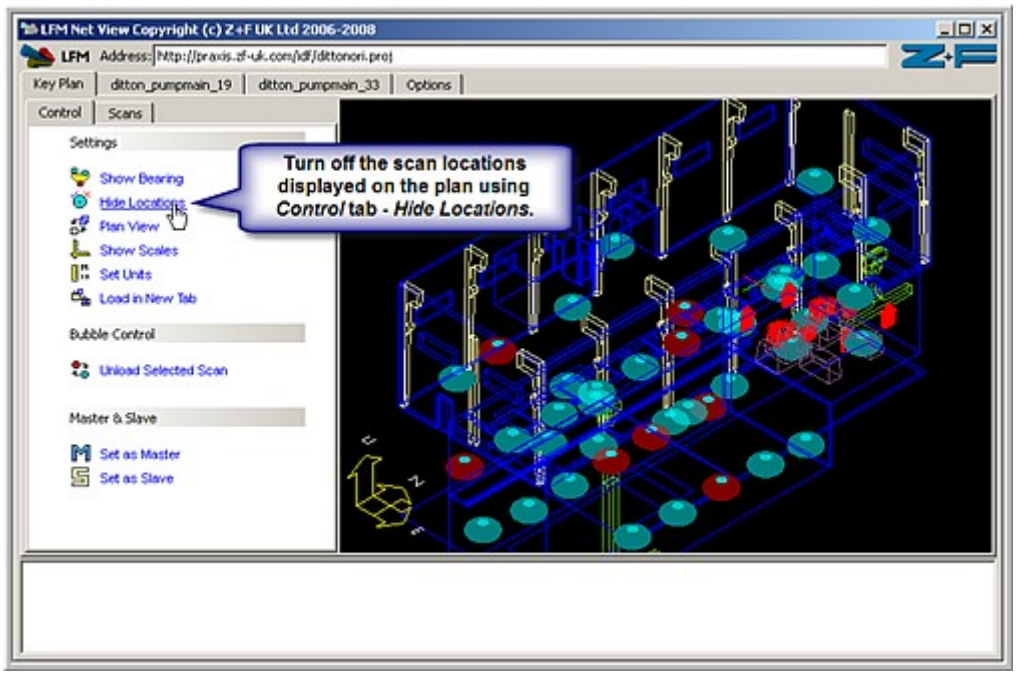
This enables to user to toggle between the scan coverage frustum. For information relating to the scan bearing display, please read section 7.4 Scan Bearing.

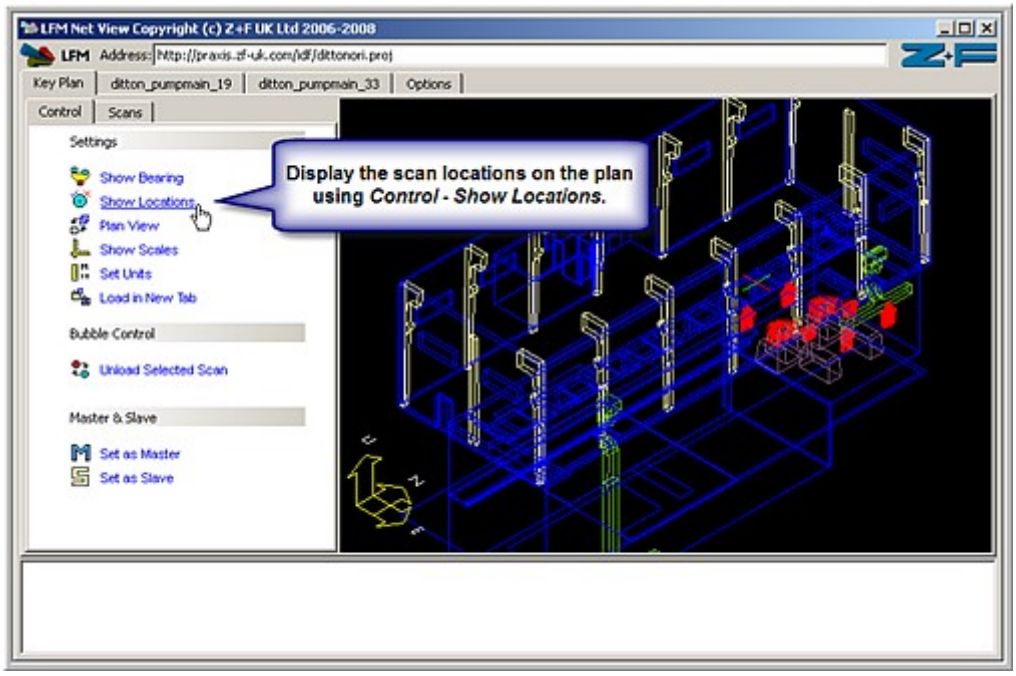




5.3.2 Locations Display

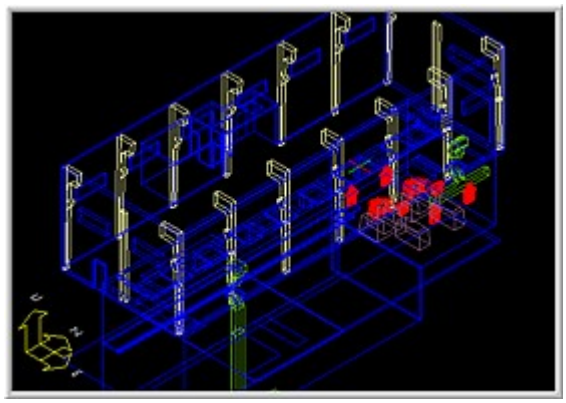
The scan site markers displayed in the plan may be toggled on/off with this function.





5.3.3 Isometric/Plan View

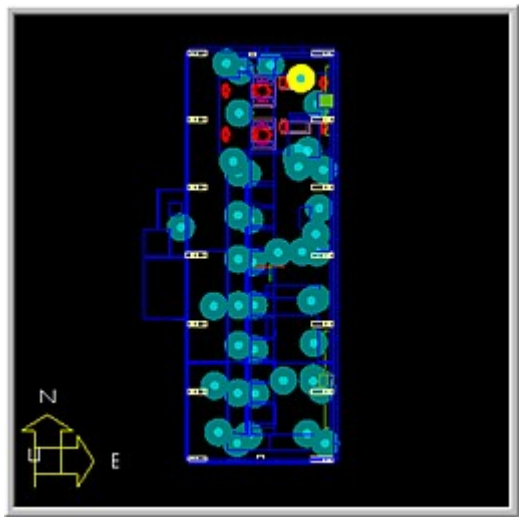
The site plan viewport may toggled between isometric or plan. For multi-levelled projects, isometric will provide greater clarity when viewing scan site markers.

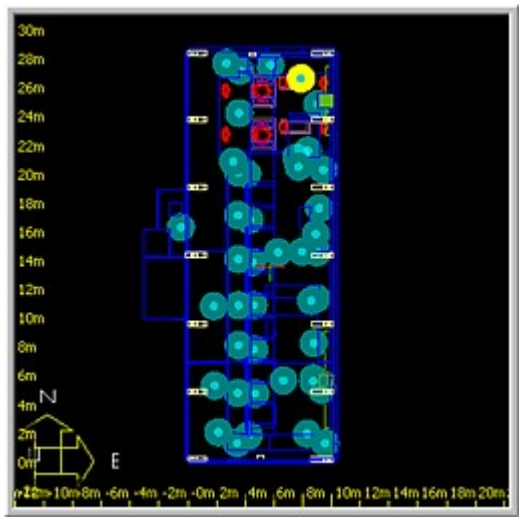


5.3.4 Scale Display

The designer may toggle the scale bar on/off.

Note: The scale bar only appears in the plan view, when switched to isometric - the scale is removed.





5.3.5 Unit Configuration

Set display units with this directly, or in the options tab.

5.3.6 Load Scans in New/Existing Tab

This function allows the user to preset the bubble viewing preferences. Whenever a scan is opened, the designer may choose to display in the same tab, or open in a new tab. If set to load in last tab, the selected scan will replace the current bubble view on the desktop. The button will toggle between the two options.

5.3.7 Load/Unload Selected Scan

This function will load or unload the selected image in the scan list.
The tab preferences described above should be set prior to use.

5.3.8 Set as Master Mode

Master & slave mode allows people to host open forums when reviewing data. Potentially, several offices can review the project data in detail as directed by the session 'Master'. Any annotations or measurements taken by the session host will appear on any of the 'Slave' desktops in real time. This system is invaluable in sharing data with design teams or asset owners in globally diverse locations; only requiring web access for all participants and a conference telephone call for voice overs.

To use this facility, one must first select the '*Set as Master Mode*' button, and assign a name for the person hosting the web session.

Once the session has ended, please select '*Turn off Master Mode*' to become invisible to other web users.

5.3.9 Set as Slave Mode

When a user wishes to join a web based review session, '*Set as Slave*' must be selected.

All participants wishing to join the review must select a group *master* from the displayed list.

Note: On busy projects, there may be several sets of people accessing the data simultaneously. Care must be taken to join the correct session.

For security, the project administrator may control access permissions for users of the database.

Additionally, all data shared across the internet is encrypted.

Once the session has ended, please select '*Turn off Slave Mode*'.

5.4 Scans Tab

5.4.1 Load Scans in Existing Tab

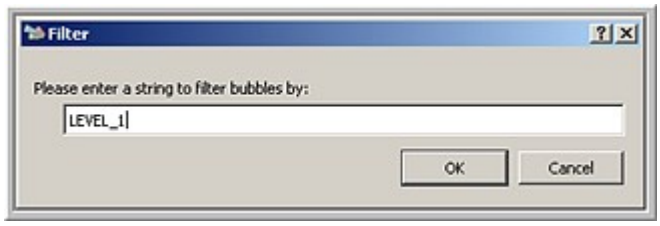
This function allows the user to pre-set the bubble viewing preferences. Whenever a scan is opened, the designer may choose to display in the same tab, or open in a new tab. If set to load in last tab, the selected scan will replace the current bubble view on the desktop. The button will toggle between the two options.

5.4.2 Load/Unload Selected Scan

This function will load or unload the selected image in the scan list.
The tab preferences described above should be set prior to use.

5.4.3 Filter

A filter may be applied to the displayed project scan list. This may be beneficial when working with large data sets, reducing the listed scans available for selection.



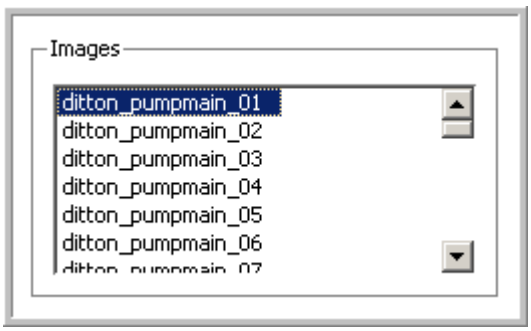
Note: When a filter is applied, the scan positional markers displayed on the project plan will change to reflect the filtered contents of the list.

5.4.4 Clear Filter

The data filter may be cancelled using the *Clear Filter* function.

5.4.5 The Image List

All project scanned images are listed in the *Scans* tab. The user may double click on any of the named images to load directly, or highlight before using the *Load Scan in New/Last Tab* function.



5.5 MarkUp

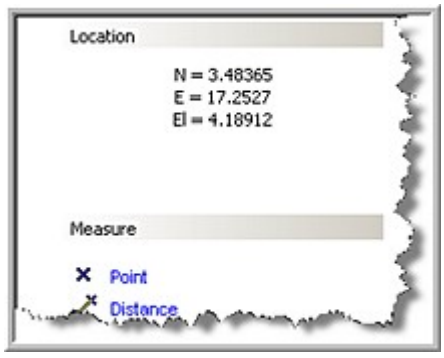
The *Mark Up* tab displays various tools to add and edit annotations and to make measurements in the scan bubble.

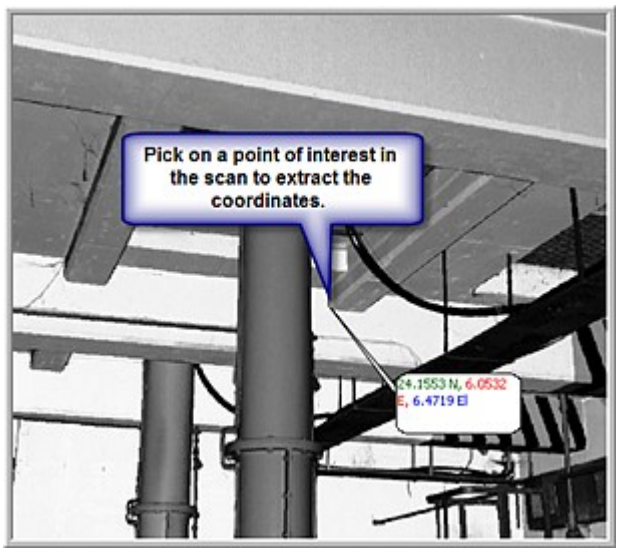
Complex revamp projects normally require a significant amount of advance planning. The annotation & measurement facility allows the designers to extract positional information, query pipe sizes, lengths & offsets, place permanent notes on the laser scans with explanations, instructions or warnings to other users.

Annotations can also be grouped into user defined category's for added convenience. When used across large projects, LFM software is able to connect to SQL databases where annotations can be stored in a secure data centre.

5.5.1 Measure - Point

Extracts the coordinate value of picked points in the scan window. The points that are selected will be displayed as an annotation. Measurements are logged in a colour which matches the axis for more rapid interpretation. Screen output units are set in options tab.



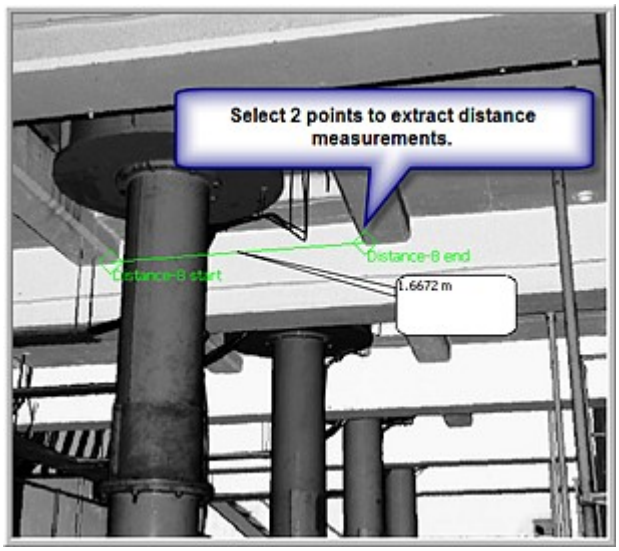


Right-click on a measurement bubble to copy values to the clipboard. This allows quick extraction of data for incorporation with other programs, or to add to reports etc.

5.5.2 Measure - Distance

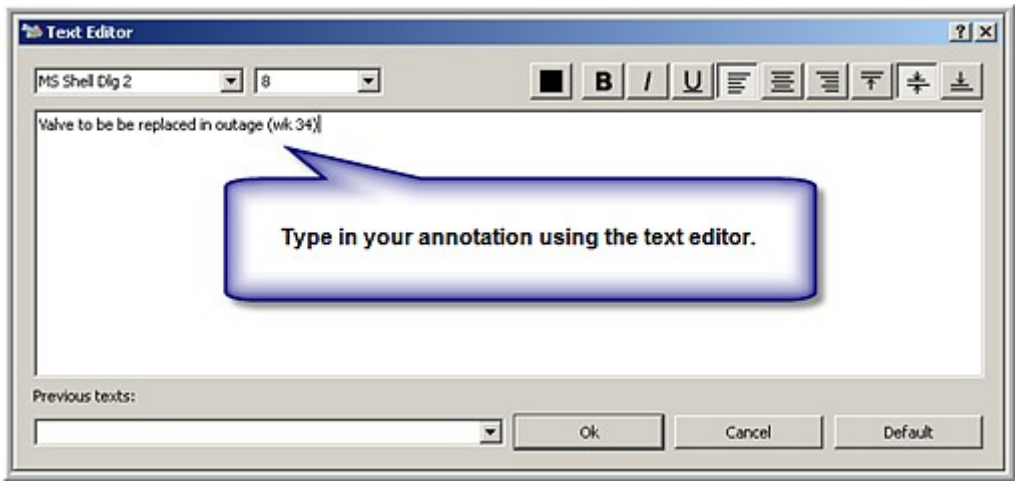
Measures the distance between 2 points in the scan window. The location of, and distance between, the points selected will be displayed in the status area of the components browser. Measurements are logged in a colour which matches the axis for more rapid interpretation. Screen output units are set in the options tab.

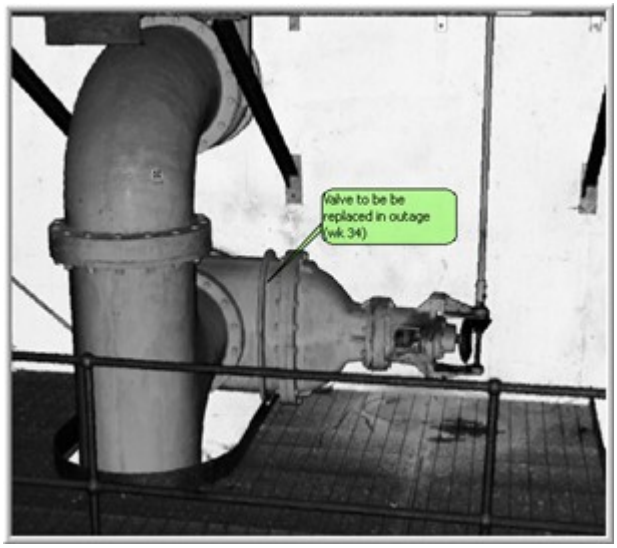
Right-click on a measurement bubble to copy values to the clipboard. This allows quick extraction of data for incorporation with other programs, or to add to reports etc.



5.5.3 Annotate - Label Point

Add a project annotation by selecting this function and clicking somewhere relevant in the scan.



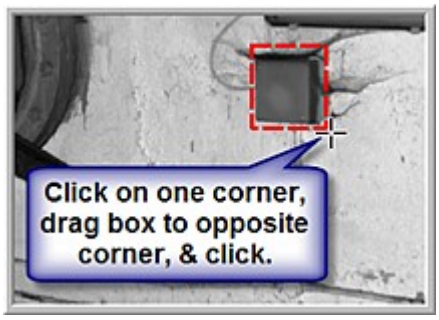


A text editor will appear on the screen, which enables the user to add the necessary notation. Text font, size, style and justification are all editable. Alternatively, the user can choose to add stored previously used text.

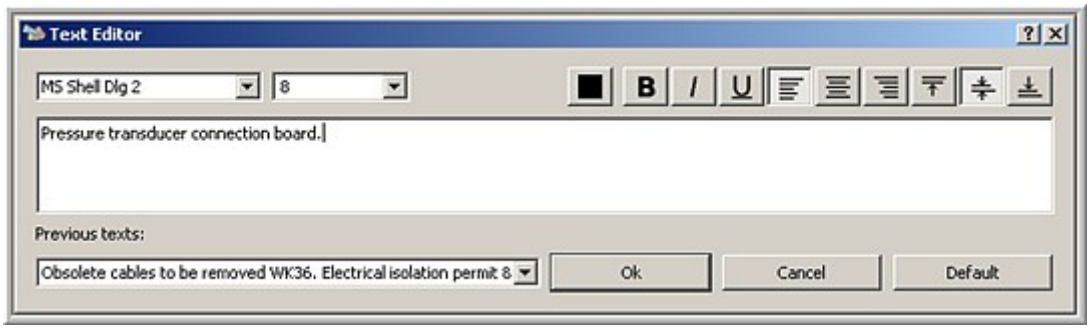
The annotation will be superimposed on the scan in a coloured 'text caption'. The colour is predetermined by the project login name/password. The NetView administrator assigns unique colours for all users or disciplines accessing the database. This allows project staff to be aware of each persons input/interest. Additionally, annotations can be filtered by user names which may clarify the scan windows in use, removing annotations with little relevance.
When the annotation appears in the scan, the user may drag it to an appropriate position for clarity.

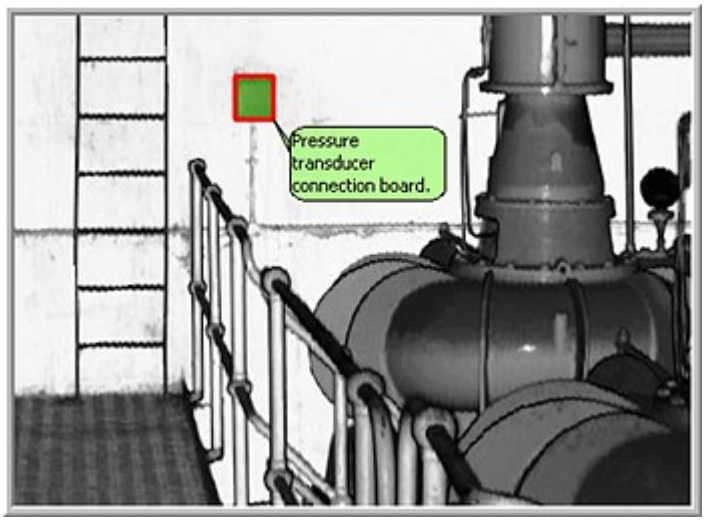
5.5.4 Annotate - Box Area

This function allows the creation of scan annotation boxes. Open a scan, click & hold on one corner of the desired box, move the mouse, and a box will then appear that can be dragged to the desired position. Close off with a mouse click. A dotted red line is displayed to aid the selection.



After the second corner is clicked, a text editor will appear on the screen, which enables the user to add the necessary notation. Text font, size, style and justification are all editable. Alternatively, the user can choose to add stored previously used text.



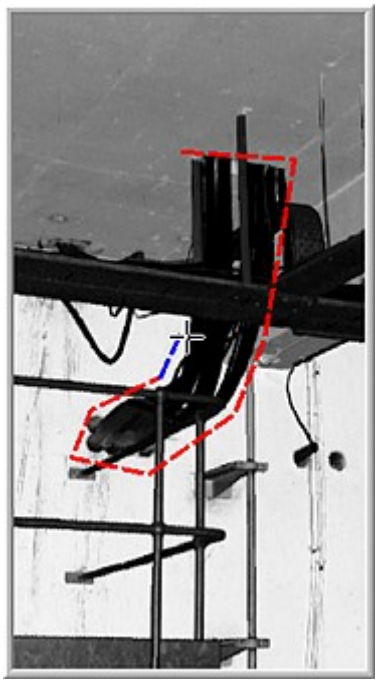


The box is superimposed onto the scan, with the text caption orbiting around one corner. Drag the annotation caption to a suitable position, and click to accept.

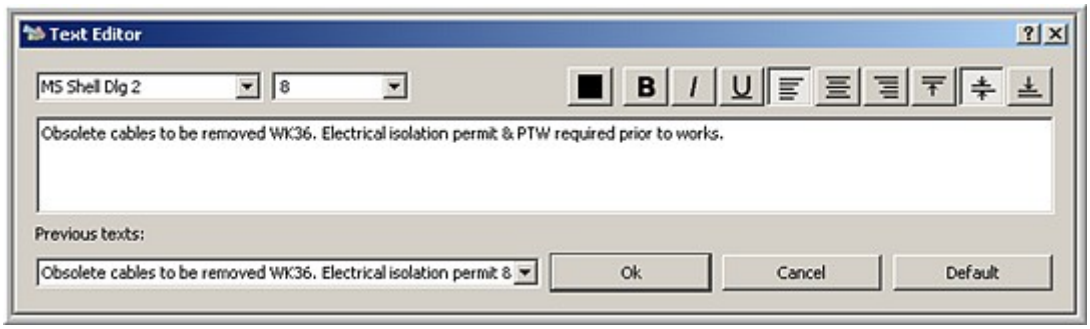
5.5.5 Annotate - Lasso Area

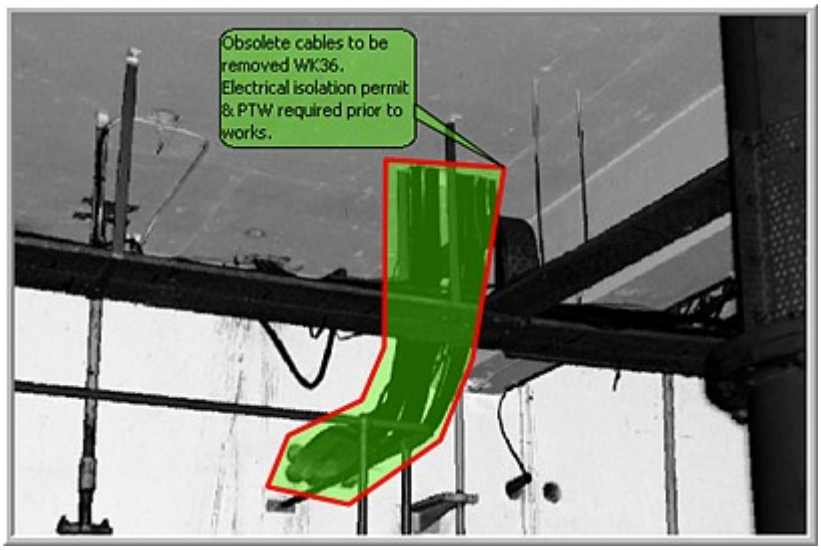
Place a non uniform annotation using this function.

Click into the scan window to highlight the area of interest. Close the fence with a right-clicking the mouse button.



When the fence has been closed, a text editor is displayed on the screen, which enables the user to add the necessary notation. Text font, size, style and justification are all editable. Alternatively, the user can choose to add stored previously used text.

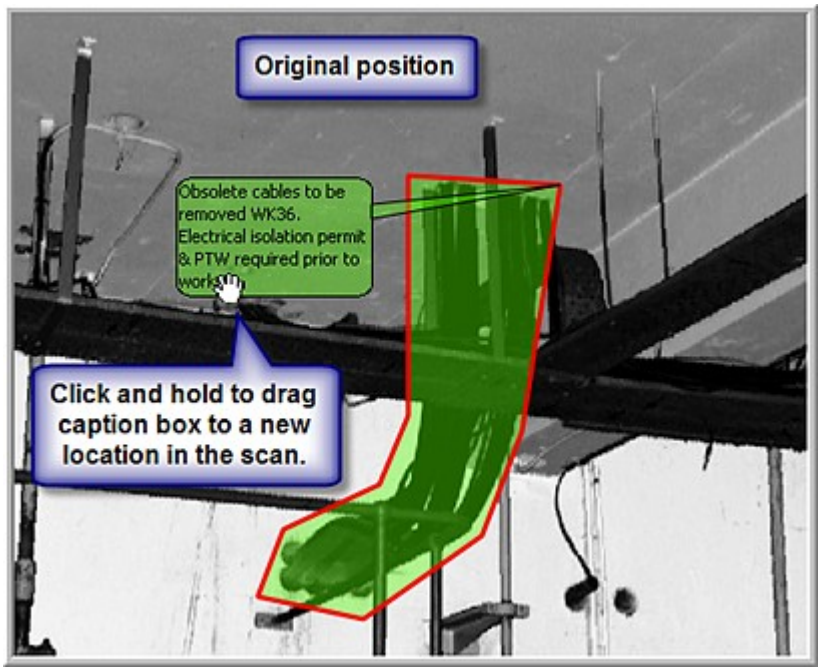




The annotation will be superimposed on the scan in a coloured 'text caption'. The colour is predetermined by the project login name/password. The NetView administrator assigns unique colours for all users or disciplines accessing the database. This allows project staff to be aware of each persons input/interest. Additionally, annotations can be filtered by user names which may clarify the scan windows in use, removing annotations with little relevance.

5.5.6 Edit - Move

Relocate the annotations using this function. Sometimes it is desirable to reposition the caption for greater clarity. Select the function, click on the annotation, and drag/drop in a new position.

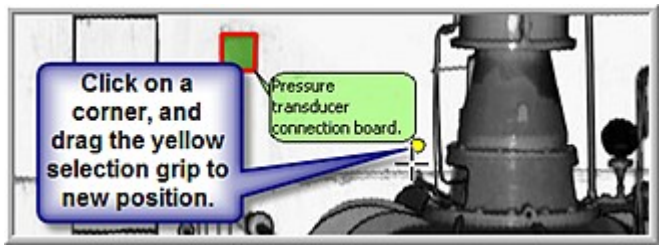


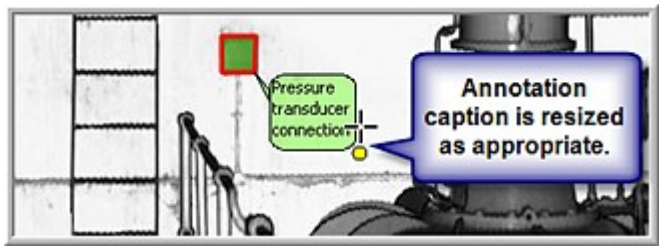
5.5.7 Edit - Delete

Use this function to remove an annotation. Simply select, and click on the annotation to erase from the database & scan.

5.5.8 Edit - Resize

Resize annotation captions with this function.



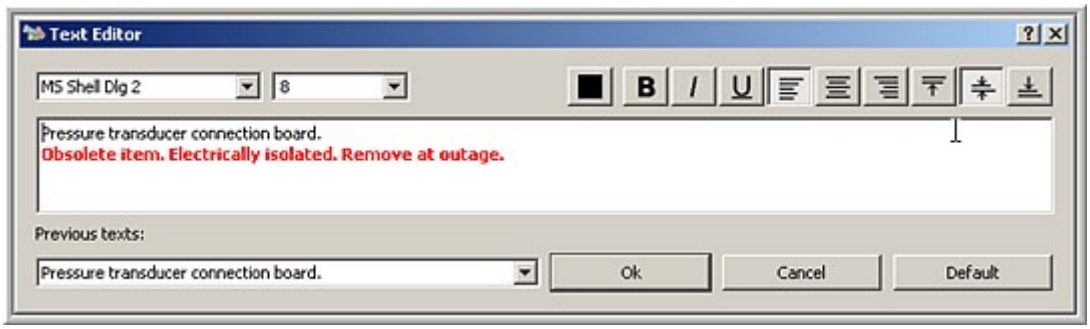


Select the function, hover over the corner needing to be modified, and a selection grip will be displayed.

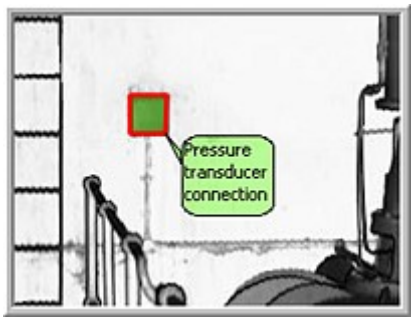
Drag the grip to resize the caption.

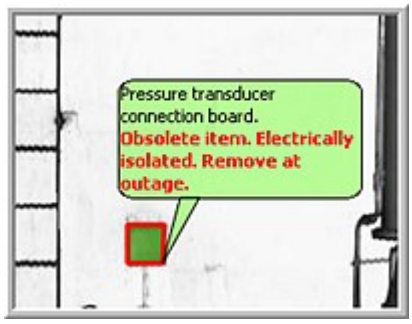
5.5.9 Edit - Modify

This function allows the user to change a stored annotation. Pick the function, and click on the caption to bring up the text editor.



The text editor will display the wording of the existing annotation. Modify, and press *OK* to update.





5.6 Manage

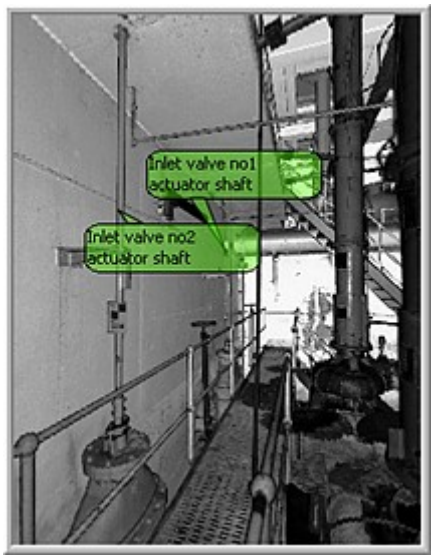
The *Manage* tab displays options to toggle the display of various mark-ups on or off. The bubble is displayed on the right of the tab.

5.6.1 Location

The current location of interest is displayed here. For example, when using the measurement functions - clicked cursor point coordinates are displayed here in turn.

5.6.2 Hide/Show Annotations

This allows the user to clear the scan window of all annotations. Once used, the *Show Annotations* button will appear allowing the user to display again.

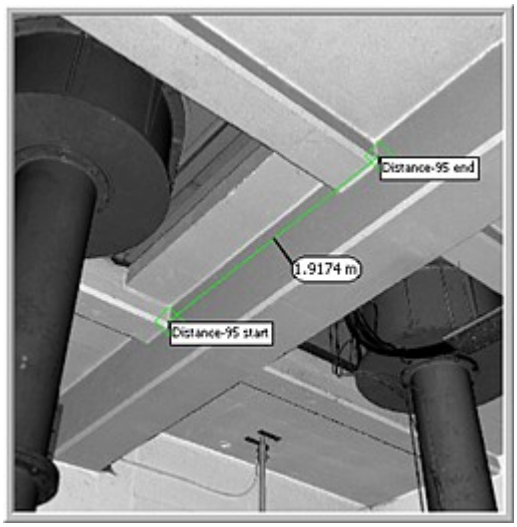


5.6.3 Hide/Show Area Of Interests

This is similar to the function listed above. Any area of interests stored in the database, can be displayed or removed from the loaded scan window.

5.6.4 Hide/Show Measurements

This allows the user to clear the scan window of all annotations. Once used, the *Show Measurements* button will appear allowing the user to display again.



5.6.5 Refresh

Refresh the NetView session to include recent changes to the database by other users.

5.6.6 Filter

A filter may be applied to the displayed project scan list. This may be beneficial when working with large data sets, reducing the listed scans available for selection.

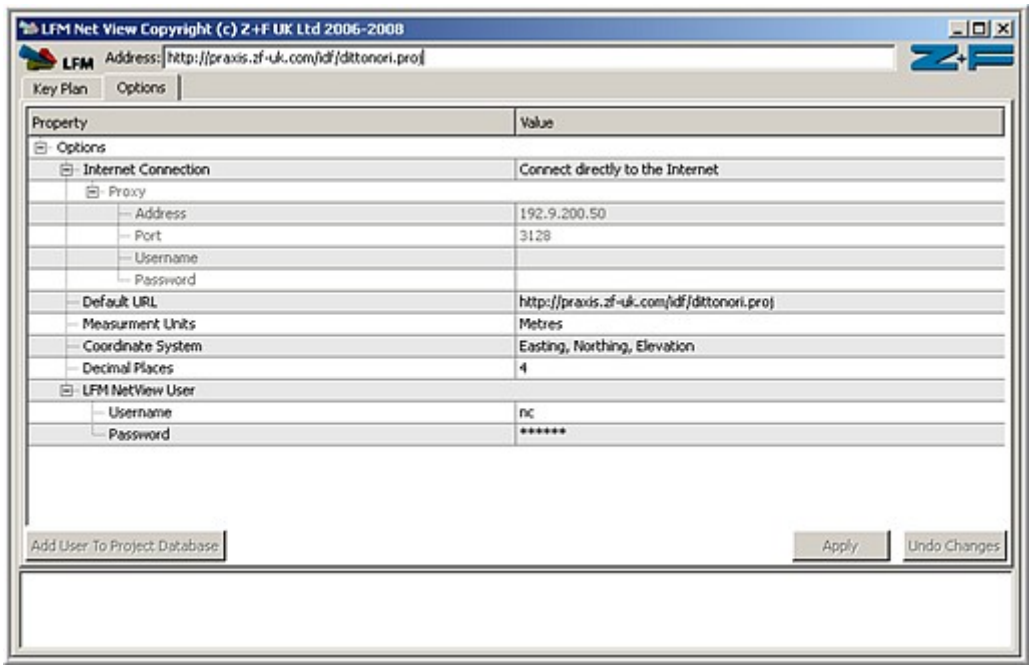
Note: When a filter is applied, the scan positional markers displayed on the project plan will change to reflect the filtered contents of the list.

5.6.7 Clear Filter

The data filter may be cancelled using the *Clear Filter* function.

5.7 Options

The options tab allows users to set connection and identity preferences when starting LFM NetView.



This dialogue box simplifies the session configuration, meaning that the user is presented with the full path to the project on start up. It also controls how NetView connects to the internet. Additionally, the user can set display preferences relating to the coordinate system, measurement precision, and display units.

OPTIONS	DESCRIPTION
INTERNET CONNECTION	
Direct	Select when not using a proxy server.
Proxy	Set up proxy server options for internet connection.
Default URL	Set the URL to project location.
Measurement Units	Toggle between metric or feet & inches.
Coordinate System	Select Cartesian (X,Y,Z), Easting, Northing & Elevation, or Northing, Easting & Elevation.
Decimal Places	Set for measurement precision.
LFM NETVIEW USER	
User name	Configure project database user name.
Password	Enter database password.

6.0 Bubble View Windows

6.1 Overview

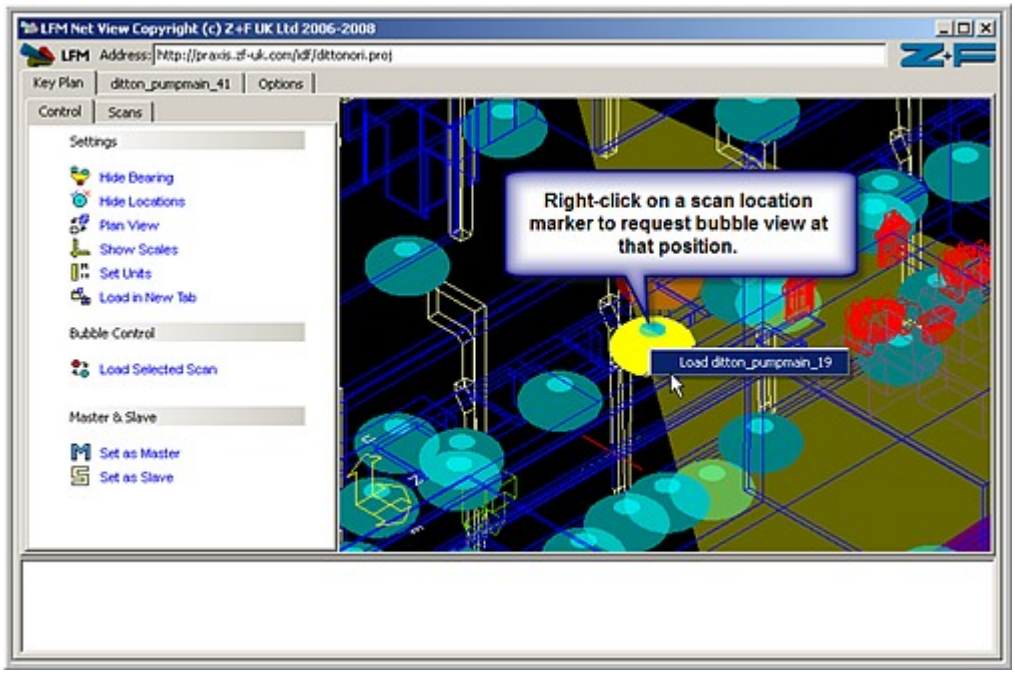
The bubble view is an intuitive method for viewing and interacting with intensity data from a laser scan.

By clicking on a scan station in the project plan, the user may load the most appropriate bubble view for the current task. The bubble image for the selected scan position is shown in a separate window.

The bubble view provides the user with a dynamic but narrow field of view at any one time, which will reduce perspective distortion in the image. The bubble view allows the designer to place themselves at any scan location and to perform a virtual fly through in the laser scan. A bubble view allows true 3D, 360º rotation of scaled picture [png], with both directional and magnification control. Real time zooming and panning give the user the sensation of actually flying around the scanned environment. Comprehensive measurement and annotation facilities are also available within the bubble environment. Bubble scans can be loaded from the project plan, or from the Components Browser - Scans - Images.

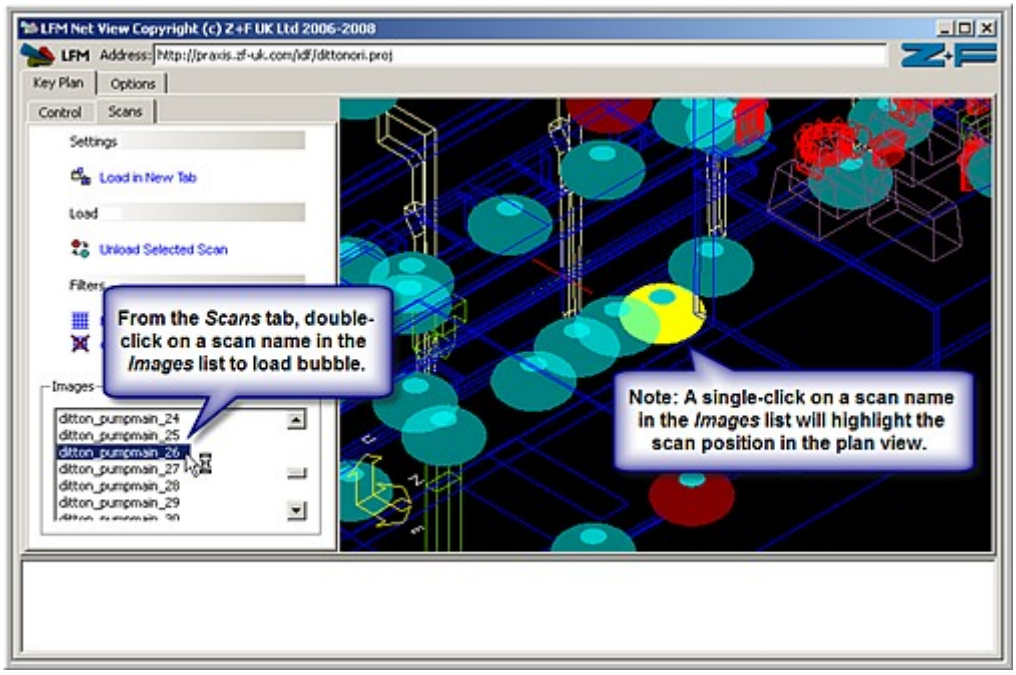
Flying in the bubble view is simple. Both mouse and keyboard can be used.

6.2 Opening a Bubble Image

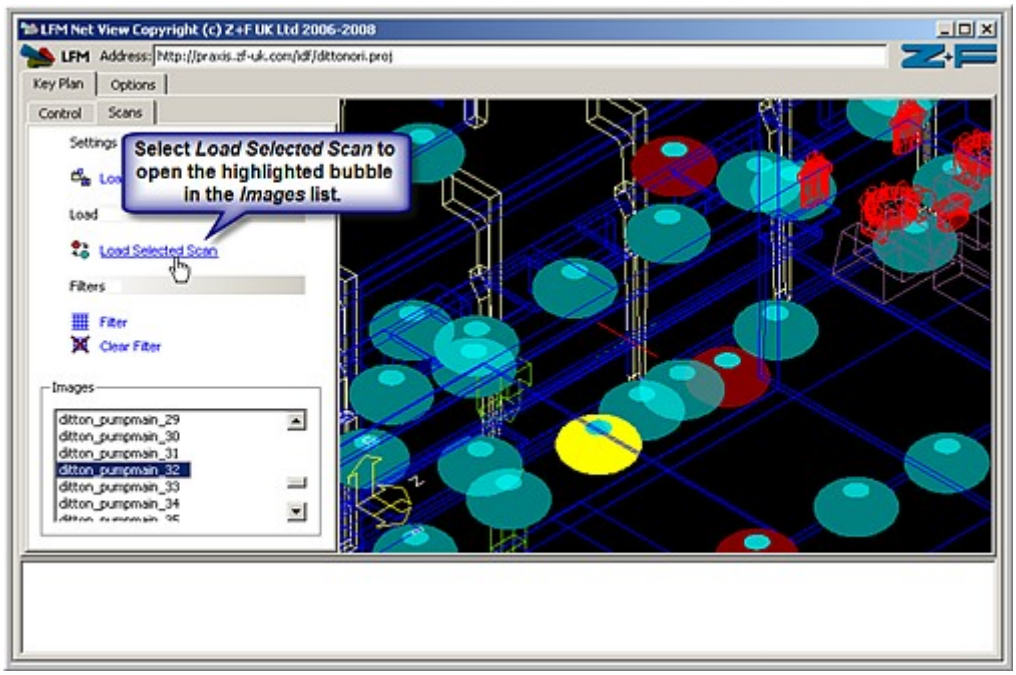


LFM NetView allows multiple scans to be loaded at once. There are three ways to load a scan in LFM NetView. Firstly, a scan can be loaded by right clicking on it on the key plan and selecting the Load bubble option from the pop-up menu.

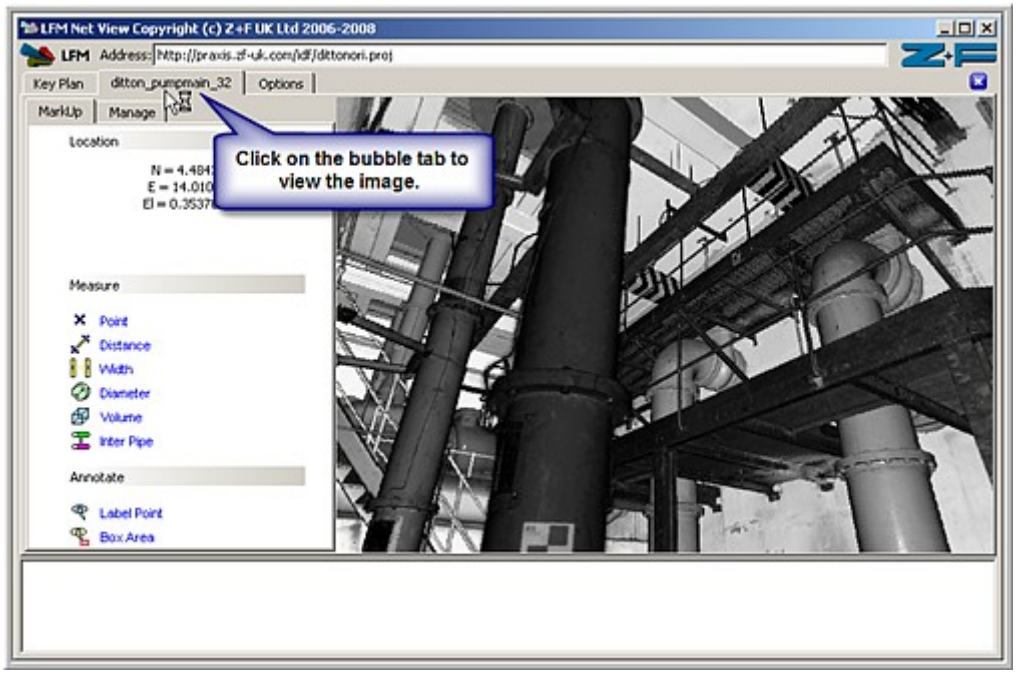
Alternatively, a scan can be loaded by clicking on the *Scans* tab on the side bar and selecting the scan name from the *Images* list and double clicking on it.



Finally, the currently selected scan can be loaded by clicking the ***Load Selected Scan*** option in the side bar.



When a bubble has successfully started to download, a new tab is created in the top level tab bar. To display the bubble, click on this tab. When the bubble has downloaded the window will resemble the following illustration.



The bubble's tab contains a second side bar on the left with two tabs entitled '*Mark Up'* and '*Manage'*. The *Mark Up* tab displays various tools to add and edit annotations and to make measurements in the scan bubble. The *Manage* tab displays options to toggle the display of various mark-ups on or off. The bubble is displayed on the right of the tab.

6.3 Bubble view navigation control

FUNCTION	STANDARD MOUSE (3BUTTON)	WHEEL MOUSE	KEYBOARD ACTION
MOVE L/R	Click & hold left button, move mouse left / right	Click & hold left button, move mouse left / right	Press left / right cursor keys
MOVE U/D	Click & hold middle button, move mouse up / down	Click & hold wheel, move mouse up/down	Press up / down keys
ZOOM IN/OUT	Click & hold right button, move mouse up / down	Scroll the wheel	Press + / - keys

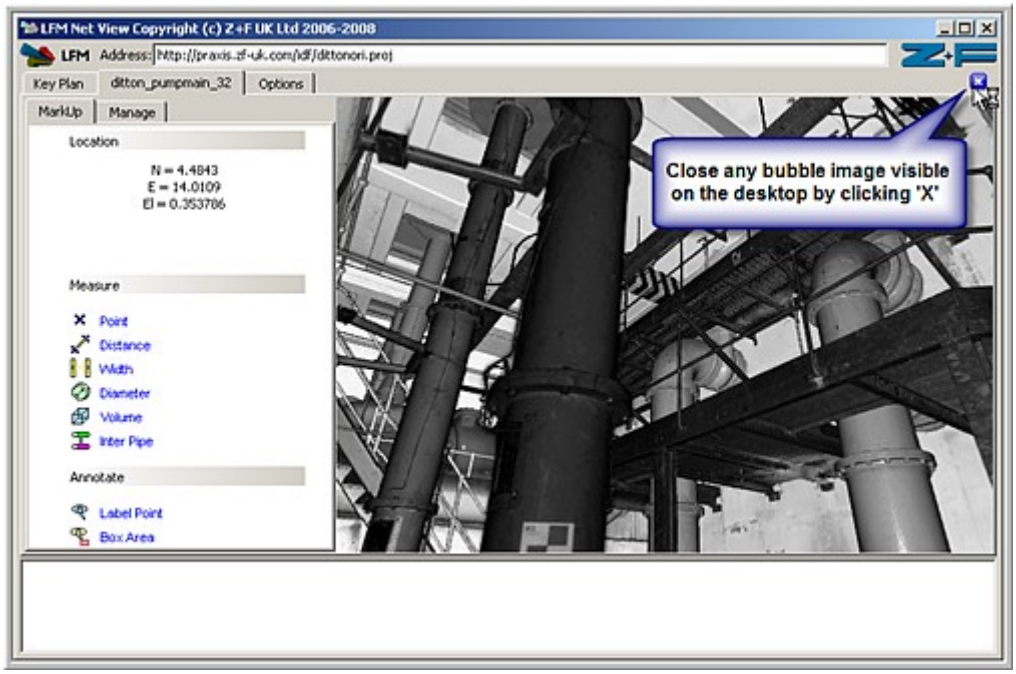
Changing Viewing Scale

The bubble window can be zoomed between 1:1 and 1:32. Default is 1:16 for a high-resolution scan (approx. 10100x4334 pixels). Zoom in by pressing the '+' key and out by pressing the '-' key.

Designers using a wheel mouse should roll the wheel for quick zoom.

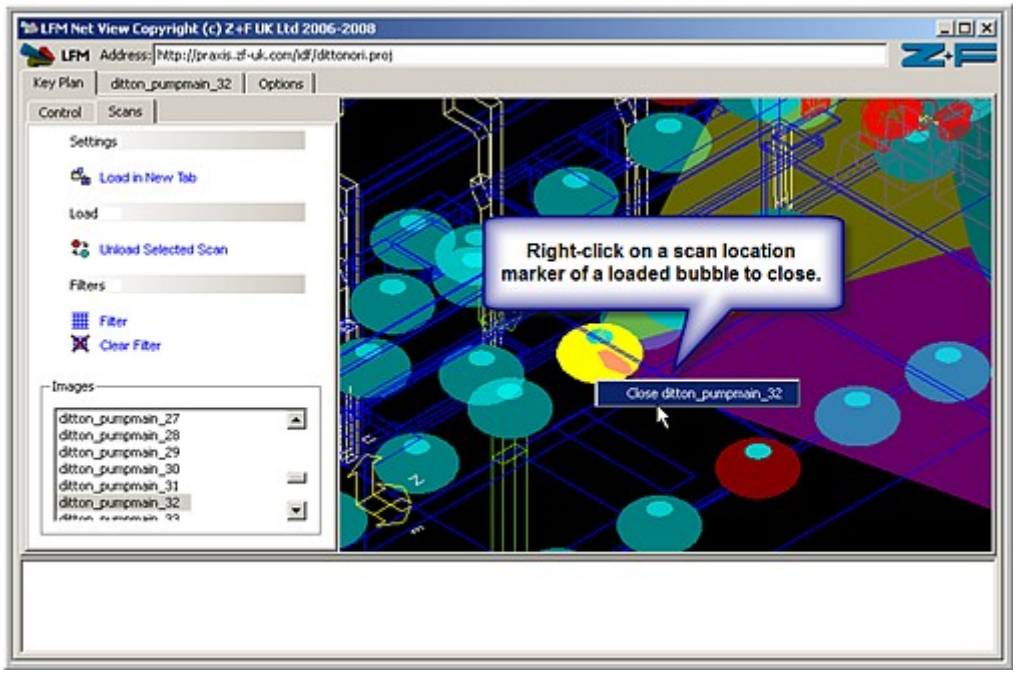
To zoom into a particular point in the image, click on it before zooming.
If a child window is selected from a sufficiently small region of the scan, it may be zoomed beyond 1:1.

6.4 Closing bubble images



There are three ways to close a loaded scan in LFM NetView. Firstly, an active scan can be dismissed from the desktop by clicking the quit button 'X' of the visible bubble.

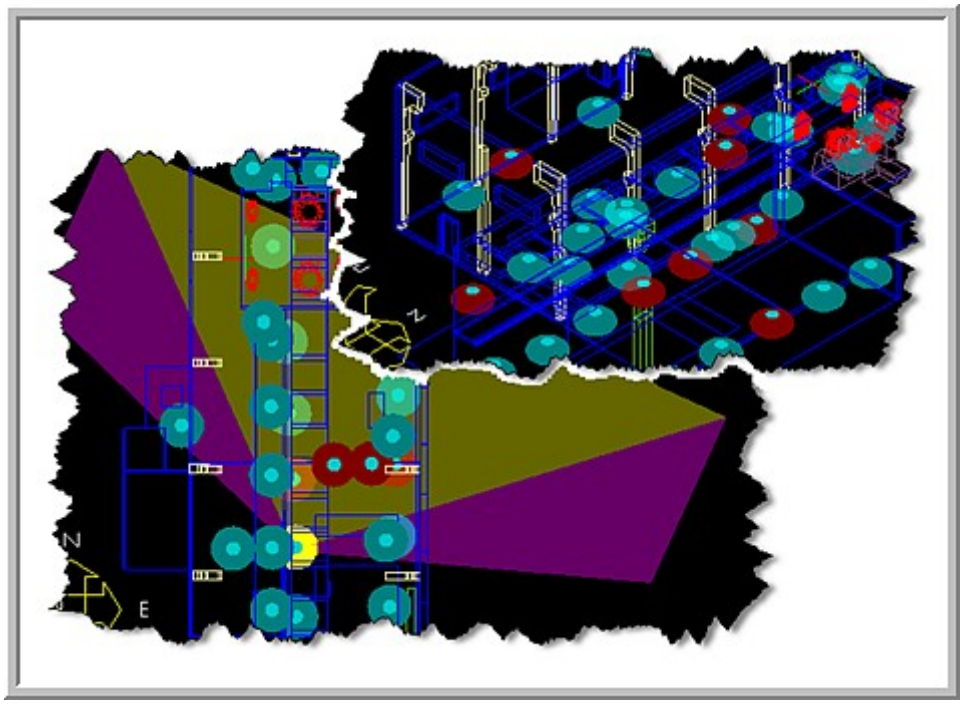
Alternatively, scans can be dismissed by right-clicking on a loaded scan station displayed in the plan view.



Finally, a scan can be closed by clicking on the *Scans* tab on the side bar and selecting the scan name from the *Images* list and using the 'Unload Selected Scan' function.

7.0 Project Plan Display

- 7.1 Overview
- 7.2 Navigation in the Plan Window
- 7.3 Scan Site Positional Markers
- 7.4 Scan Bearing



7.1 Overview

LFM Net-View provides the ability to interact with a CAD drawing linked to a project. This drawing gives the user a spacial framework of the scanned project from which to work. The plan has individual scan position markers superimposed to show where they were captured. These markers quickly allow the designer to make a decision as to which is the most appropriate scan to load onto the Net-View desktop for review.

This facility is useful in several ways. For the designer, it aids the understanding of the work zone significantly by providing a frame of reference within which to work. The plan is presented to the user in either plan or isometric form for clarity, and the scan site markers are coloured to to highlight which bubble images are being currently displayed. The showing of the location of scans can be toggled using the ***Show Locations/Hide Locations*** button on the side bar.

If shown, scans are coloured differently depending on whether they are loaded or not. Unloaded scans are coloured blue, whilst loaded scans are coloured red. The currently selected scan is coloured yellow irrespective of whether or not it is loaded. A scan can be selected by clicking on it in the key plan with your left mouse button.

For loaded scans, a view-frustum can be toggled using the ***Show Bearing/Hide Bearing*** button on the side-bar. When displayed, view-frustums show the direction that each loaded scan is looking in and how much is visible in the scan.

The key-plan viewport can be switched between isometric view and a plan view, by either pressing the <Ctrl> key or toggle the ***Iso View/Plan View*** button on the side bar.

It is possible to navigate around the key plan using your mouse. To pan around the key-plan hold down the left mouse button over the plan and move your mouse around. You can zoom in on a feature of the key plan by rotating your mouse wheel forwards. To zoom back out rotate the wheel backwards.

7.2 Navigation in the plan window

Navigation through the plan - either in plan or isometric view mode - is achieved with the following mouse operations.

MOUSE BUTTON OPERATION	ACTION
LEFT BUTTON, DOUBLE CLICK	The eye position jumps to the position of the mouse click.
LEFT BUTTON, CLICK & DRAG	Drags the eye position in any direction across the plan.
RIGHT BUTTON, ON A SCAN POSITIONAL MARKER	Opens a context menu of scans taken from this position, from which one can be loaded.
RIGHT BUTTON, IN FREE SPACE ON PLAN	Returns the position of cursor in drawing units.
WHEEL ROLL (CTRL – RHMB)	Zooms into or out of the plan.

Note: Toggle view mode using the *Ctrl* key or toggle the ***Iso View/Plan View*** button on the side bar.

7.3 Scan site positional markers

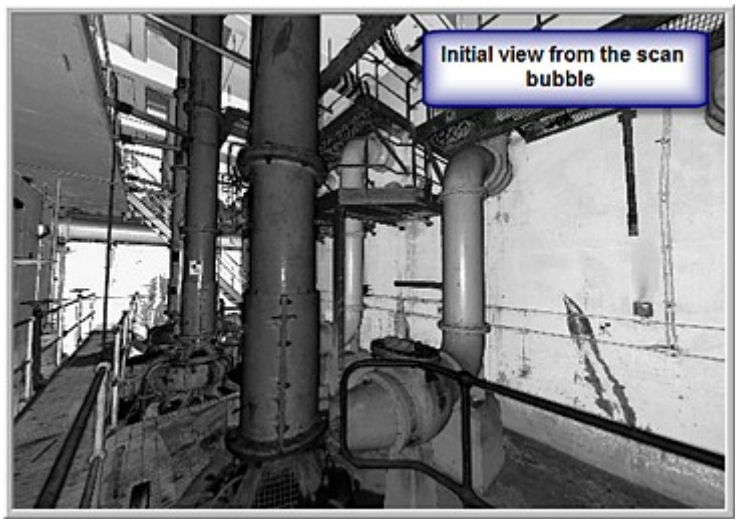
The circles are not intended to show scan coverage, but the image origin. Colour coding is as follows:

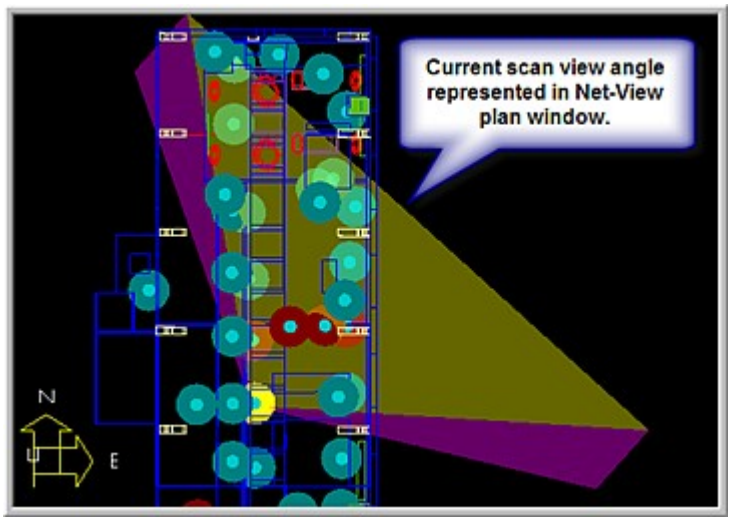
NODE COLOUR	DESCRIPTION
BLUE	Unloaded scan position
RED	Loaded scan position
YELLOW	Scan currently selected in *Image* list

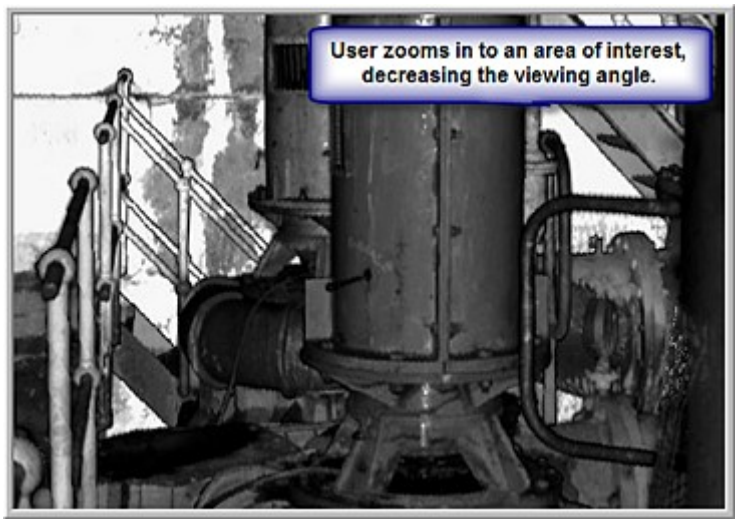
7.4 Scan bearing

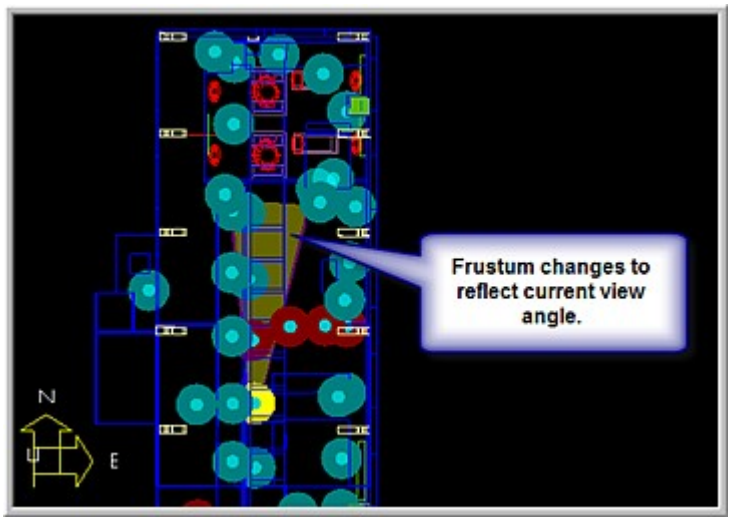
For loaded scans, a view-frustum can be toggled using the Show Bearing/Hide Bearing button on the side-bar. When displayed, view-frustums show the direction that each loaded scan is looking in and how much is visible in the scan.

In simple terms, the viewing angle displayed in the scan bubble is equal to the view-frustum. As a scan bubble is 'zoomed in', the frustum angle displayed is narrowed. Please see the examples below.




Current scan view angle represented in Net-View plan window.
N
E


User zooms in to an area of interest, decreasing the viewing angle.


Frustum changes to reflect current view angle.
N
E

8.0 Status Window

- 8.1 Overview
- 8.2 Example

8.1 Overview

The status window will present the user with information and prompts. Connection error information relating to the project identification, licensing, or internet settings will be reported here. Guide information to help the user understand the various functions will also appear here.

8.2 Example

This is a typical error condition when a user is trying the initiate master/slave mode.

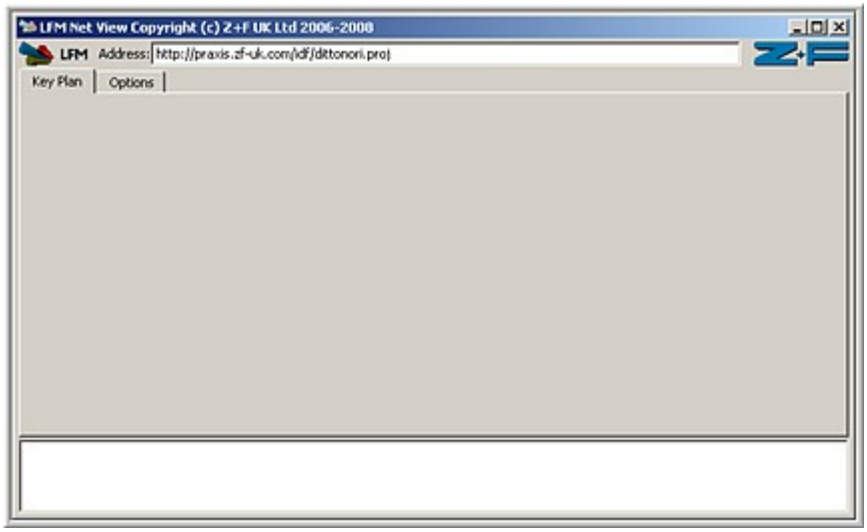
9.0 Net-View Initial Configuration

- 9.1 Configuration options
- 9.2 Configuring your connection to the internet
- 9.3 Specifying a default project
- 9.4 Customising a measurement display
- 9.5 Configuring users

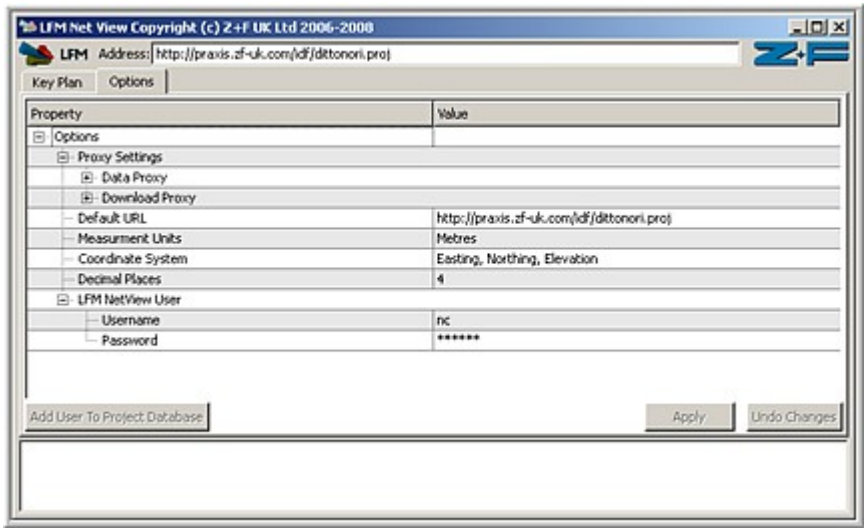
9.1 Configuration options

Starting

When you first load LFM NetView, you will be presented with a window as illustrated. The window consists of two tabs, one entitled '*Key Plan'* is initially blank. The second '*Options'* allows you to configure how LFM NetView works. Additionally there is an *address bar*.



The LFM NetView Options tab displays various properties that can be used to configure LFM NetView. The main section consists of a 'tree view', which groups properties into different aspects of the configuration. Groups of properties can be expanded by clicking on the '+' icon next to the name of the group. Similarly, a group of properties can be collapsed by clicking on the '-' icon next to the name of the group. The fully expanded Options tab is illustrated in the Figure.



9.2 Configuring your connection to the internet

The proxy settings section of the options tab allows you to set up how LFM NetView should connect to the Internet. LFM NetView allows different settings for the download of files (such as bubbles, projects and floor-plans) and the retrieval of data (such as measurements and annotations). If you use the same connection settings for file download and data retrieval, then you should put the same details in both the download proxy and data proxy sections of the options tab.

If you have a direct connection to the Internet (i.e. you do not use a proxy), then you should ensure that the **Address** boxes are clear and that the **Port** boxes are set to zero ('0') under the **Proxy Settings** options.

If your connection to the Internet is via a proxy, then you will need to fill in the proxy settings in NetView's Options tab. In the **Address** boxes you should enter the IP address of the proxy server, and in the **Port** box should contain the port number that you need to connect to on the proxy server specified in the address box.

If your proxy server requires authentication using a username and password, you should enter your username and password in the **Username** and **Password** boxes in the **Proxy Settings** respectively. To connect without using a username and password, leave these boxes blank.

If you do not know how your computer connects to the Internet, or are unsure of specific settings such as the address of a proxy on your network, please contact your network administrator.

9.3 Specifying a default project

The address of the project that is displayed in the address bar when you first load LFM NetView can be configured using the **Default URL** option. The address specified here will be displayed every time that you load LFM NetView. This is similar to the “Home Page” option of your web browser and provides a useful alternative to having to write the full address of a project each time that LFM NetView is loaded.

9.4 Customising a measurement display

Measurement Units

To configure the units in which measurements are displayed, select the appropriate option in the **Measurement Units** box. There are currently two options *metres* and *feet and inches*.

Coordinate System

The coordinate system that measurements are displayed in can be modified using the **Coordinate System** option. Three options are currently provided *Cartesian* (x,y,z), *Northing Easting and Elevation*, and *Easting Northing and Elevation*.

Decimal Places

The number of decimal places that are displayed for measurements can be configured using the **Decimal Places** option. On clicking this box, there are two ways to change the number of decimal places. Firstly, you can enter the number of decimal places that you wish to display using your keyboard. Alternatively, you can increase or decrease the number of decimal places by clicking the up or down buttons, respectively.

9.5 Configuring users

When a user makes an annotation in LFM NetView, the details of the user making the annotation are automatically recorded based on the user details entered in the **User Initials** option. This allows LFM NetView to control who can modify an annotation and to display all annotations made by a particular user in a colour that was selected when the user was added to the user database.

Specifying the Current User

The **User Initials** option specifies the user that is currently using this copy of LFM NetView. The name or initials entered into this box should be a user who has been added to the project's User Database.

10.0 LFM NetView 1.0.0 Release Notes

Release: 7th October 2008

First release of the software.

Notes

11.0 Product Support

Online Support

Online support and more information about LFM should be requested via support.vision@zf-uk.com

LFM Net-View Upgrades

Upgrades can be downloaded from the Z+F website at https://praxis.zf-uk.com/downloads/index.html

To use the download site, it is necessary to have a Username and Password. Customers with support can request these details by via support.vision@zf-uk.com