DEIF A/S

Operator's Manual

-power in control

M-Vision

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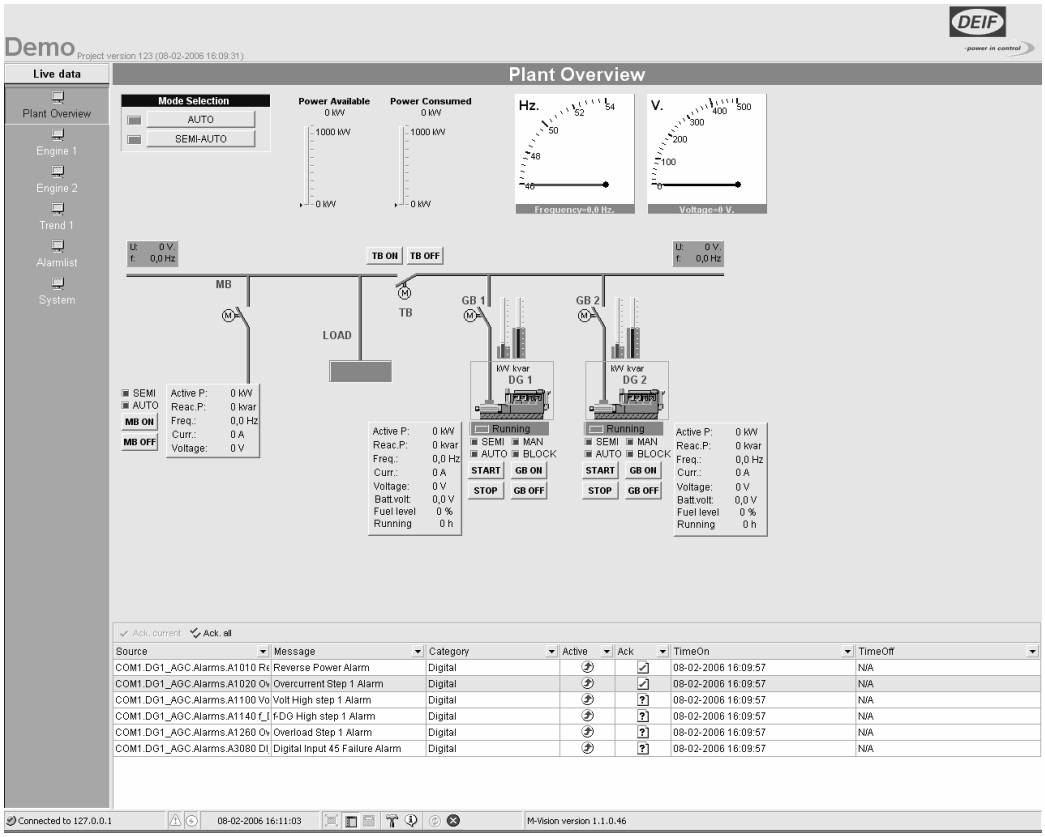

- *Client server application*
- *Remote control*
- *Data logging and trending*
- *Alarm monitoring and logging*
- *Report generator*
- *OPC based software*

CE

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1. Introduction

Warnings and legal information

You may install and use one copy of the software product, or any prior version for the same operating system, on a single computer.

The software product is licensed as a single product. Its component parts may not be separated for use on more than one computer.

You may not reverse engineer, decompile or disassemble the software product, except and only to the extent that such activity is expressly permitted by applicable law notwithstanding this limitation.

NEITHER DEIF A/S NOR ANYONE ELSE WHO HAS BEEN INVOLVED IN THE CREATION, PRODUCTION OR DELIVERY OF THIS SOFTWARE PRODUCT SHALL BE LIABLE FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES (INCLUDING DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION, AND THE LIKE) ARISING FROM THE USE OR INABILITY TO USE SUCH SOFTWARE PRODUCT EVEN IF DEIF A/S HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

M-Vision

M-Vision is a Windows-based software for Human Machine Interface of a power plant controlled by DEIF multi-line 2 or Delomatic systems.

M-Vision communicates with the control system of the power plant through a standard OPC driver. It retrieves all analogue and digital values for real time visualisation and logging purposes. It also provides the possibility of sending commands to the control system.

M-Vision includes the following functions:

- Alarm management (see below)
- Trending (see below)
- Driver (Modbus/OPC) which links the control system to the application
- Data logger: The data read by the driver are periodically saved into a database located on the server
- Report generator (see below)

The application developed on the M-Vision software can be configured by DEIF according to customer specifications or by the customer himself, by means of the 'M-Vision designer' tool. An application will typically provide the following user screens:

Plant overview

This screen provides all information concerning the electrical plant in the form of animated graphical objects on a single line diagram (mimic). It is also the user interface for sending commands to the plant such as start/stop of the engine, breaker synchronisation or running mode of the plant, if permitted by the control system. Additionally, some other screens can be developed in order to provide extra monitoring possibilities of other parts of the plant.

Alarm and events

The alarm screen shows a dynamic list of alarms and events currently present in the control system. The alarms appear in different colours according to their status (acknowledged or not, active or inactive) as well as their types.

M-Vision can be configured to redirect these alarms to:

- A matrix printer
- A database (see Report section)

Trending

M-Vision also has some trending capabilities where any analogue or digital value present in the control system can be displayed in the form of real time curves. The number of trending screens depends on the customer specifications.

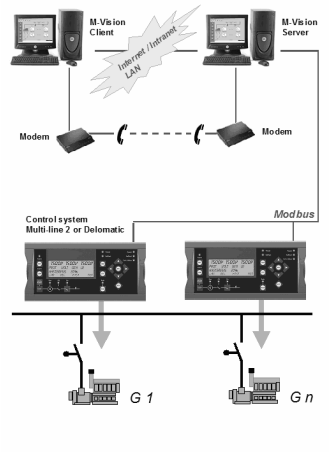
It is possible to zoom in on segments of the trending curves in order to observe a specific time interval. A time cursor allows the user to scroll back and forth.

The trending can be printed out to e.g. a colour printer.

Report

M-Vision also provides reporting possibilities based on data from the data logger and/or the alarm manager databases.

The layout of the reports depends on the customer specifications. Any report can be printed out.



In addition to the M-Vision server, located on site, the system can share its screens and reports with one or several remote client applications. The facilities provided by M-Vision server and client are completely identical, but the server application uses some extra modules as summarised below:

	M-Vision client	M-Vision server
Visualisation	●	●
Reporting	●	●
Data logging		●
Alarm logging		●
Driver		●

The communication between M-Vision client and M-Vision server can be established through:

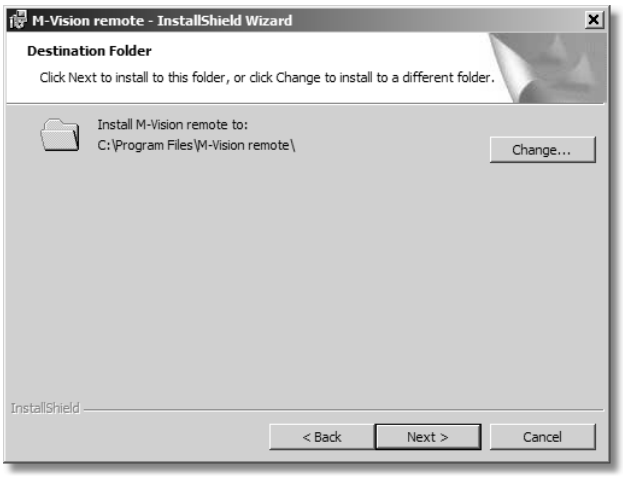
- A modem connection

Installation instructions

NOTE:
If you want to install the M-Vision server, and if you intend to allow access to the server/site to one or several M-Vision client applications, you must make sure that the standard Windows XP Pro web server is installed before starting the installation process. This procedure is described in the chapter Web server for M-Vision server on page 13. If your project does not require the installation of the web server, e.g. the M-Vision server will run autonomously, you can begin the installation (you will probably get a warning message during the installation, which is to be ignored).

The installation procedure is quite simple, and an installation wizard will start right after you have inserted the M-Vision CD in your CD drive. If you have chosen to disable the 'CD autoplay' function on your computer, you will have to start the wizard manually. It is located at the root of the M-Vision CD-ROM and named AutoRun.exe.

Choose the application you want to install, either M-Vision client (client server) or M-Vision server, by pressing the corresponding button on the installation wizard. When the Windows installer is started, you can choose the directory in which the M-Vision server/client will be installed as shown below:

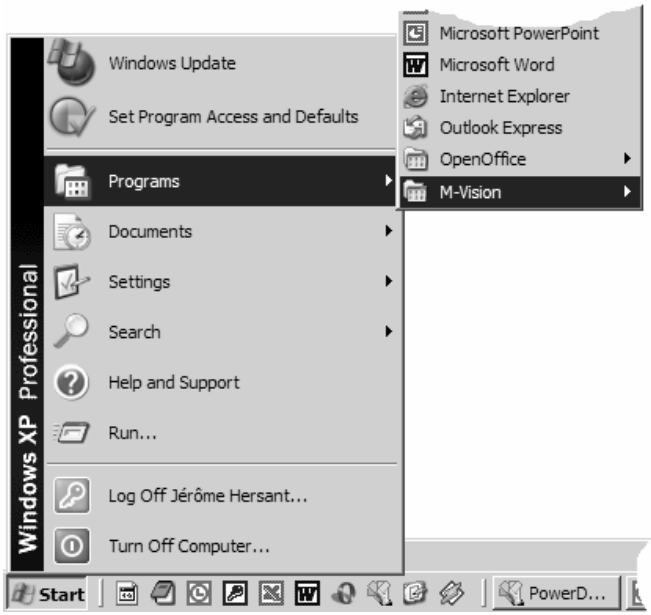


The default directory is:

- C:\Program files\M-Vision for M-Vision server
- C:\Program files\M-Vision remote for M-Vision client

If your version of Windows is another than English, the name of the directory 'Program files' will be changed accordingly (e.g. to 'Programmer' if you are using a Danish version of Windows).

A new program group called M-Vision will then be created:



The contents of the program group is:

M-Vision Driver configuration	for M-Vision server
M-Vision	for M-Vision client

Registration

Running an M-Vision product (client, server or designer) requires a license from DEIF. While unregistered the products are fully functional, but have the following limitations:

- M-Vision server or client will shut down automatically after 5 hours of activity
- DEIF will not provide free support

When you start an unregistered application, a notification message will pop up and provide the possibility of launching the registration process. This process consists of two steps:

- Send your user key to DEIF, bea@deif.com (you can copy and paste the user key into a mail program such as Outlook)
- DEIF will then process your user key and subsequently issue a registration key. This key is to be entered or pasted into the 'Registration key' field

NOTE:
A registration key is linked to the computer on which the user key has been generated. This means that you cannot use an existing registration key on another computer.

Starting the application

M-Vision server

Before starting the M-Vision server, a full M-Vision project must be present in the project subdirectory, such as C:\Program files\M-Vision\Project. If it is not present, then the constitutive files of an M-Vision project have to be installed properly on the server (this action is also called project deployment).

A full M-Vision project consists of:

1. Project file (*.project file) containing the following:
   - General information on the project
   - Available screens
   - Available reports
   - Various configuration files for the M-Vision tasks or modules
2. Logging databases
3. Alarm database
4. Driver configuration

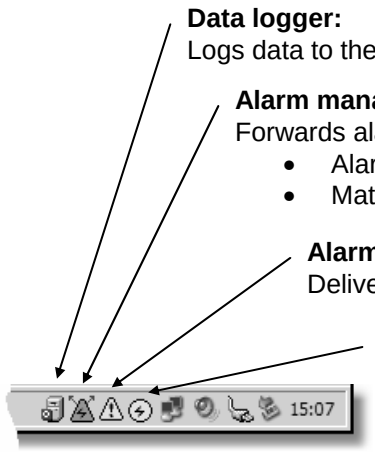
A full M-Vision project is organised as follows:

- M-Vision root (C:\Program files\M-Vision for instance)
  - Subdirectory Project
    - Subdirectory Databases
    - Subdirectory Driver settings

The location of these items is as follows:

M-Vision root	
Directory 'Project'	Contains the project file (*.project) (item **1.**)
Directory 'Databases'	Contains the alarm database (item **3.**) and the logging database (item **2.**) if used in the project
Directory 'Driver settings'	Contains the driver configuration file (item **4.**), a Microsoft Access database

Click on the M-Vision icon in the M-Vision program group to start the M-Vision server application. The project located in the project subdirectory will be loaded automatically, and the various M-Vision tasks will be loaded.



Data logger:
Logs data to the logging database

Alarm manager:
Forwards alarms to:

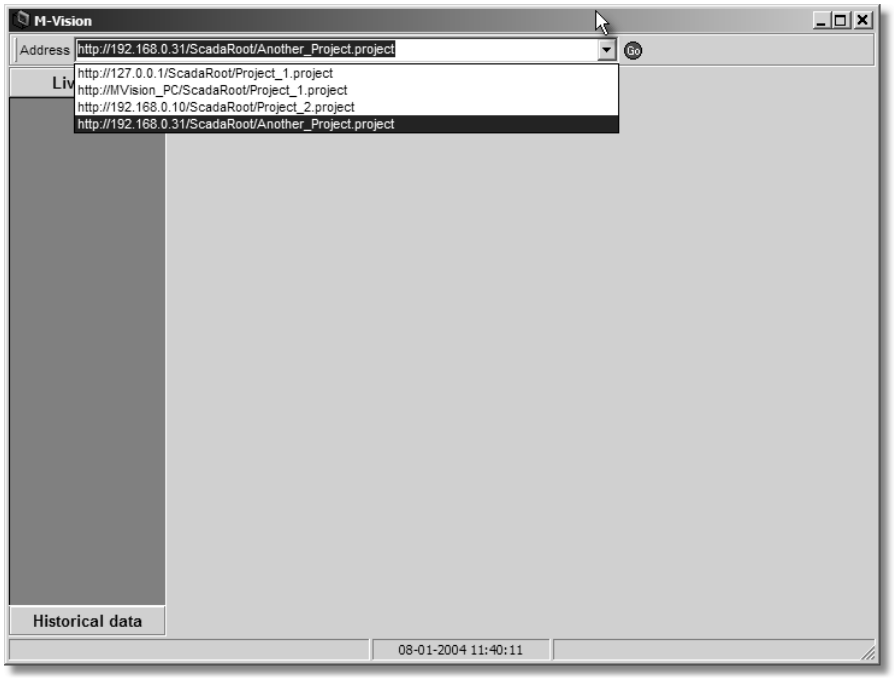
- Alarm database
- Matrix printer

Alarm link:
Delivers alarms to the various modules and the remote client(s)

Data link:
Delivers data to the various modules and the remote client(s)

M-Vision client

Click on the M-Vision icon in the M-Vision program group to start the M-Vision client application. The following window will appear on the screen:



The project file is accessible through a web server located on the M-Vision server computer. The address of this project file is a regular internet address (URL) like:
http://*Server_name_or_IP_address_here*/ScadaRoot/*Project_file_name_here* where Server_name_or_IP_address_here is the network name of the server (mvision_PC for instance) or the IP address of the server (127.0.0.1 or 192.168.0.10 for instance) and Project_file_name_here is the name of the project file (Project_1.project or Another_Project.project for instance). The network name or IP address of the server should be known by the project manager.

Examples:

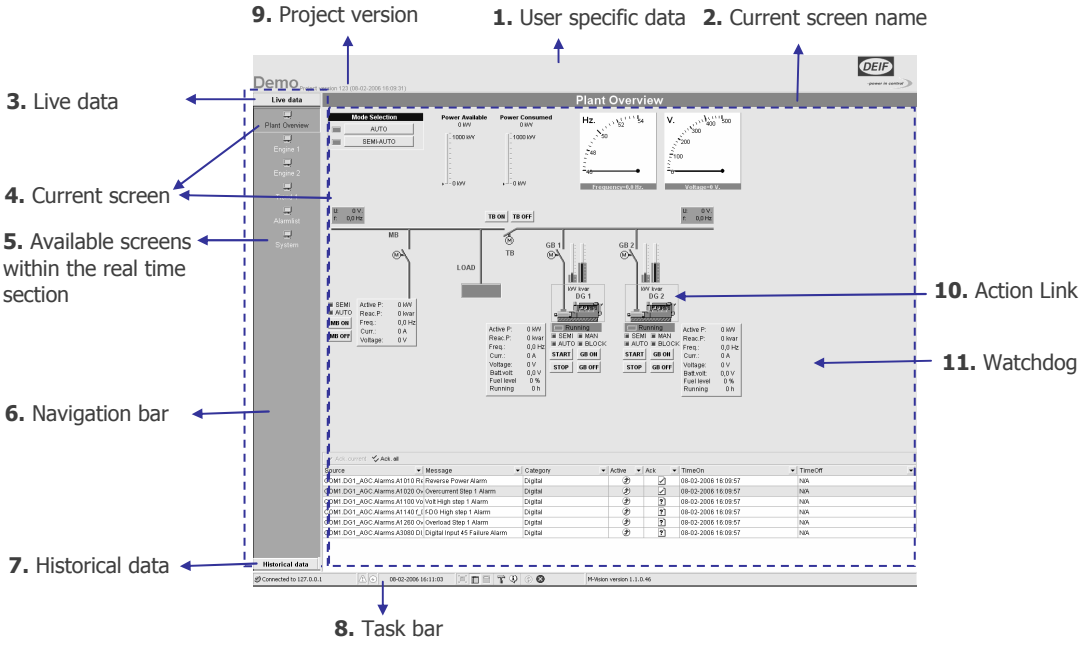
- http://127.0.0.1/ScadaRoot/Project_1.project
- http://mvision_PC/ScadaRoot/Project_1.project
- http://192.168.0.10/ScadaRoot/Project_2.project
- http://192.168.0.31/ScadaRoot/Another_Project.project

Click on the 'Go' button or press enter in the 'Address' field to download the project file and establish connection with the server.

2. Screen by screen description

Overview of the graphical interface

The graphical interface of the software is as shown in the picture below:



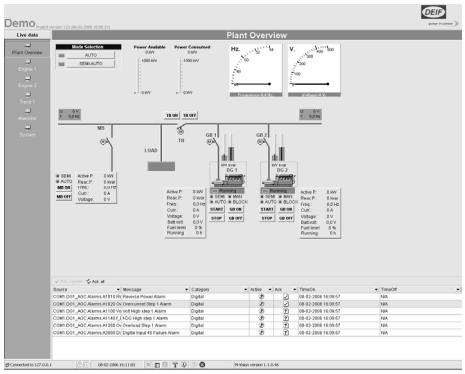
Legend:

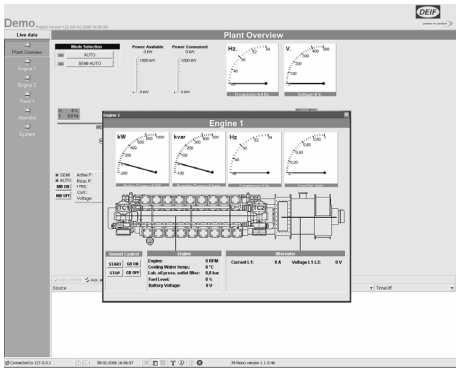
1. This section usually contains the logo of the software supplier as well as the name of the power plant [1].
2. Name of the screen which is currently displayed in area 4.
3. The different screens available in the application are grouped into 2 sections: 'Live data' (the values displayed are continuously updated by the software) and 'Historical data' (the values are displayed on user request and retrieved from databases present on the server). Click on the corresponding bar to display the available screen of the section.
4. Area where the current screen is displayed.
5. Short cut to all screens available within this section. Click on the icon of the screen you would like to display in section 4.
6. Navigation bar. Enables the user to access the different screens available within the application.
7. See 3.
8. This section contains information about the connection, tools, version and shut down button.
9. This section contains information about the M-Vision project version.
10. Action Link component can be seen as a raised border around an object. Clicking on the action link makes it possible to open e.g. the engine screen in a pop-up window. It can also be configured to close a window or launch an application. This is made in the designer and cannot be edited from the server or client.
11. Watchdog function monitors the connection quality of a defined tag and can be configured in a number of ways to either turn on a LED with the text COM ERROR or open a red window covering all measurements. Again this is made in the designer and cannot be edited from the server or client.

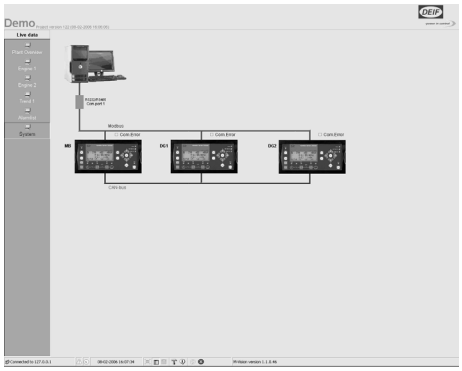
[1] Other data may be displayed here for your specific project.

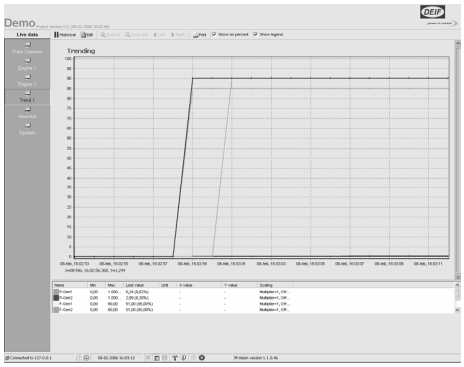
Plant overview

The layout of the screens depends on the specifications of the application. The screens below are examples of various available DEMO screens.



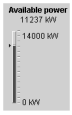






The following graphical components may be used to build the screens:

Breaker position: Identical to a remote position indicator of a switchboard. May be placed on a vertical or horizontal bar. This object indicates the position of the breaker as well as its name (at the bottom).



Bar graph: Used for indication of analogue values. The tag name is indicated at the top as well as the current values. The same values are represented as a coloured bar beside the scale of these values (from the minimum to the maximum value).

Meter: Identical to an analogue instrument on a switchboard. The tag name is indicated at the bottom as well as the current values.

Command button: Identical to a push-button on a switchboard. Used to send a command to the control system of the plant. Note that the control system may not consider this command, if the plant is not ready for it.
This button may also be inactive, which means that the control system cannot accept the corresponding command at the current plant status.

Busbar: The busbar can be selected in various different shapes.

LED: Identical to a LED on a switchboard. Used to indicate the status of a binary tag. The name of the tag is displayed on the right of the LED.

Analogue values: Any analogue values/tags present in the software may be displayed as a numerical value attached to its name and unit.

Image: Any image may be displayed on the screens.

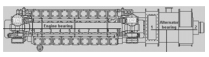
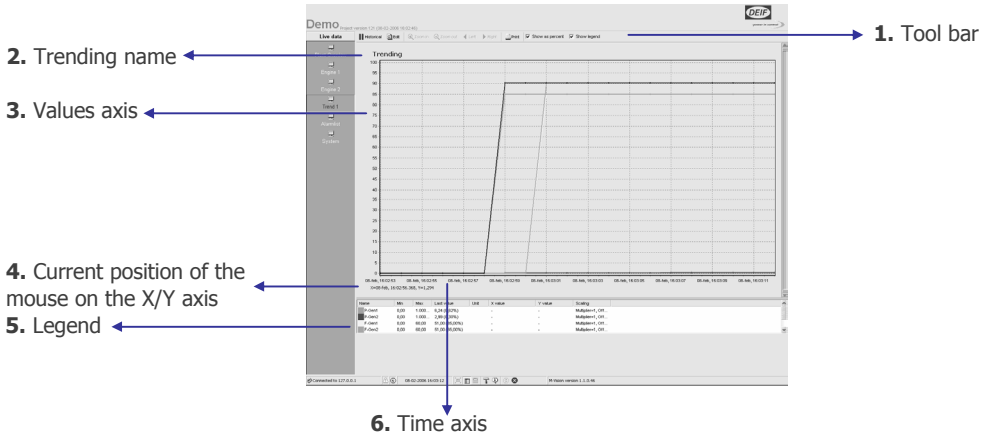


Image (2): Any image may be displayed on the screens.

Trending: The trending graphical component is used for displaying tags in the form of curves on a time axis. Each trending component may display several tags. Some screens may contain only one or several trending components.



Legend:

1. The tool bar gives access to several functionalities and parameters of the trending (see description below).
2. Name given to the graph. This text can be hidden.
3. Y axis/value axis of the trending.
4. Displays the position of the mouse on the time/value axis (the mouse must be within the plotting area).
5. Displays the information about the tag currently plotted.
6. Time axis. The graph scrolls from right to left. The points plotted on the extreme right part of the chart represent the most recent values of the tag.

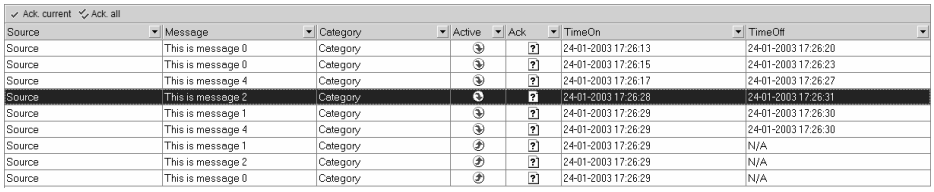
Tool bar:

Historical:	Shifts to the historical mode. In this mode the trending is frozen to its latest status. The user then has the possibility of browsing the values previously displayed on the screen. In historical mode this button will display 'Real-time' and can be used to shift back to the normal trending mode.
Edit:	Selection of the tags to be plotted on the chart.
Zoom in:	(Historical mode only). Magnifies the time axis in order to get a close view of a part of the chart.
Zoom out:	(Historical mode only). Enlarges the time axis in order to get a wider overview of the chart.
Left/right:	Translates the time axis in order to see older values (left) or newer values (right).
Print:	Sends the image of the chart to the connected printer (screen hard copy).
Show as percent:	When this box is checked, the value axis is scaled from 0 to 100%. The values are plotted according to their minimum value (0%) and maximum value (100%).
Show legend:	Hides/shows the legend area of the trending.

Alarm screen

The alarm screen displays the list of alarms and events active in the control system and M-Vision software. The screen is composed by a tool bar (at the top) and a grid on which each line represents an alarm and each column a property/status of this alarm.

Each column can be sorted and filtered. Click on the arrow at the top right of a column to display its property.



Source	Message	Category	Active	Ack	TimeOn	TimeOff
Source	This is message 0	Category			24-01-2003 17:26:13	24-01-2003 17:26:20
Source	This is message 0	Category			24-01-2003 17:26:15	24-01-2003 17:26:23
Source	This is message 4	Category			24-01-2003 17:26:17	24-01-2003 17:26:27
Source	This is message 2	Category			24-01-2003 17:26:28	24-01-2003 17:26:31
Source	This is message 1	Category			24-01-2003 17:26:29	24-01-2003 17:26:30
Source	This is message 4	Category			24-01-2003 17:26:29	24-01-2003 17:26:30
Source	This is message 1	Category			24-01-2003 17:26:29	N/A
Source	This is message 2	Category			24-01-2003 17:26:29	N/A
Source	This is message 0	Category			24-01-2003 17:26:29	N/A

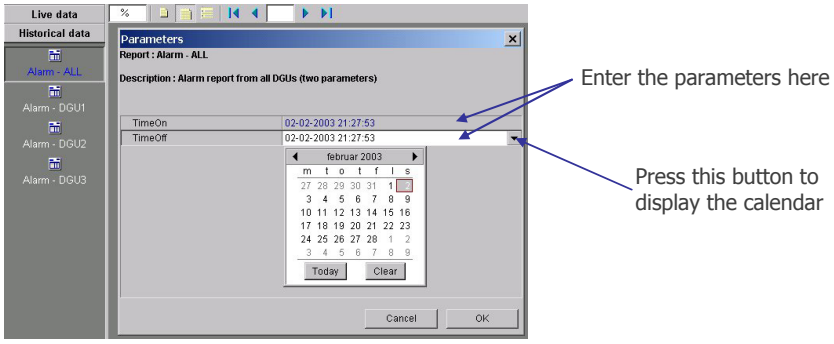
Tool bar: Ack. current: Acknowledges the alarm selected in the grid.
Ack. all: Acknowledges all active alarms selected in the grid.

Columns:
Source: Indicates the source of the alarm (project specific).
Message: Text of the alarm.
Category: The alarms of the system may have been grouped into several categories (project specific). It may e.g. be Warning/Critical/Shut down.
Active: If a red arrow appears in this field, the corresponding alarm is still active in the control system. If a green arrow is displayed, this means that the alarm has been active in the control system, but not acknowledged.
Acknowledged: If XXX is displayed, the alarm has not been acknowledged by the user. An alarm which is acknowledged and not active anymore will disappear from the list.
Time ON: Time stamp of the alarm when appearing in the list (alarm active).
Time OFF: Time stamp of the alarm when its status has gone back to normal in the control system (alarm inactive).

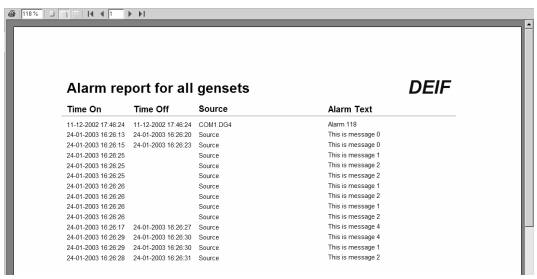
Report

You can access a report from the 'Historical data' section of the navigation bar of M-Vision. The reports present the data from the databases saved by the data logger or the alarm manager. These reports may then be printed or saved on the hard disk. When clicking on a report icon, the user is prompted to enter the parameters of the report. Typically, these parameters will form a time interval during which all logged values will be displayed in the report.

As an example, the alarm report will require the following parameters:



Click 'OK' to display the report.

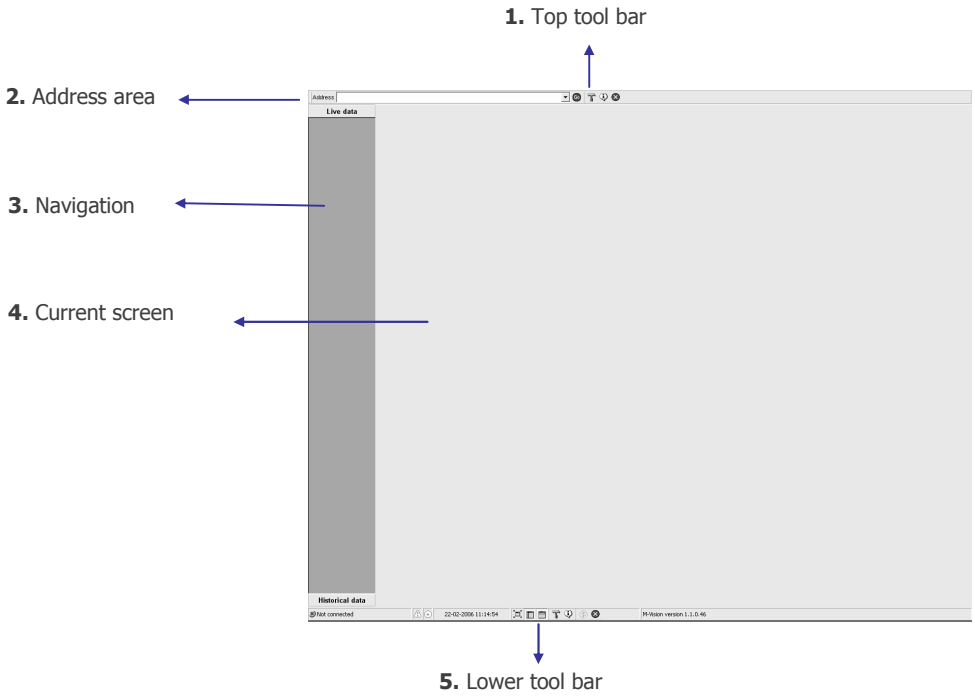


From the tool bar at the top of this screen you can print the report, browse it (in case it contains several pages) and zoom in on it.

Client

Overview of the graphical interface

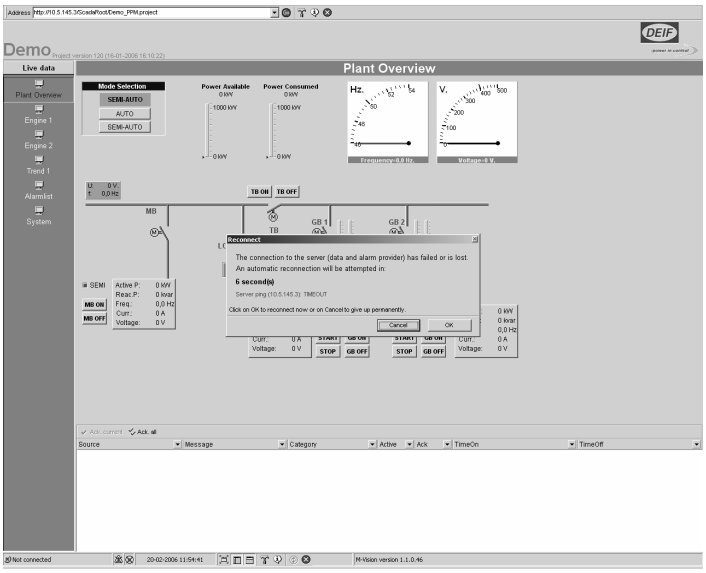
The graphical interface of the client software is as shown in the picture below:



Legend:

1. The tool bar gives access to several functionalities of the client layout
2. Address area to enter URL address to the server e.g. http://192,168,0,10/ScadaRoot/PPM_Demo.project
3. Navigation bar like on the server.
4. Current screen like on the server.
5. Lower toll bar gives access to several functionalities of the client layout

If a disconnection of the client occurs, the client will automatically try to ping the server and reconnect. The ping result and connection status are shown on the screen in a pop-up window. See the screen dump below.



3. Installation and configuration issues

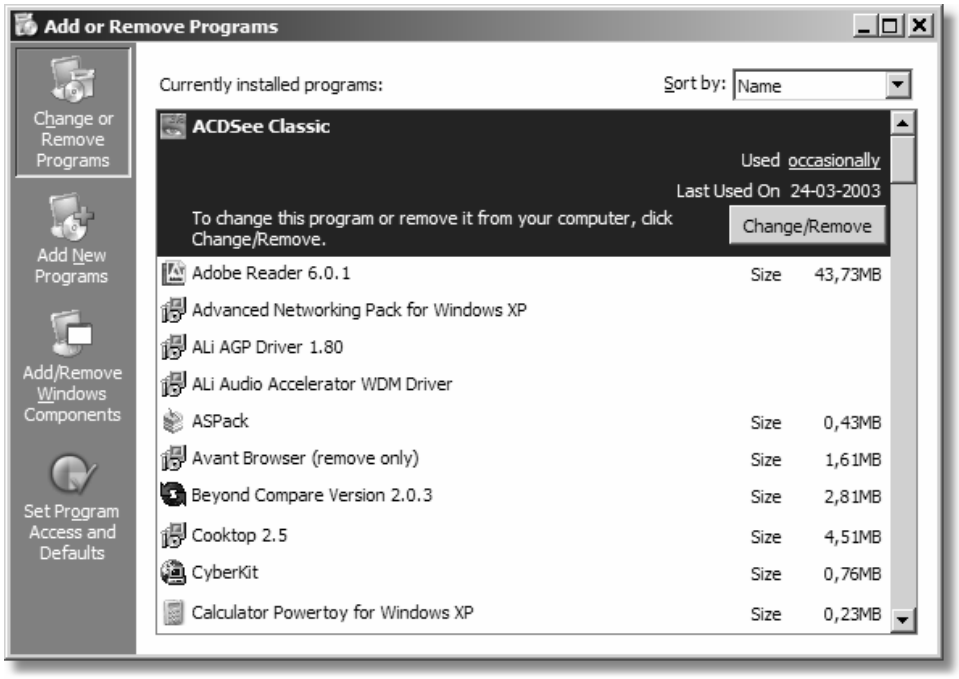
This chapter is only relevant, if you intend to allow remote connections, e.g. that one or several M-Vision client applications will access the server.

If you intend to do so, you must make sure that the Internet Information Services (IIS) from Microsoft (essentially the web server) are installed before launching the installation.

Web server for M-Vision server

A standard Windows XP Pro installation does not include IIS, which means that it is likely, IIS are not present on your computer. If this is the case, you will have to perform this operation manually. This is not a problem, as IIS are actually part of your Windows XP CD (Pro version only).

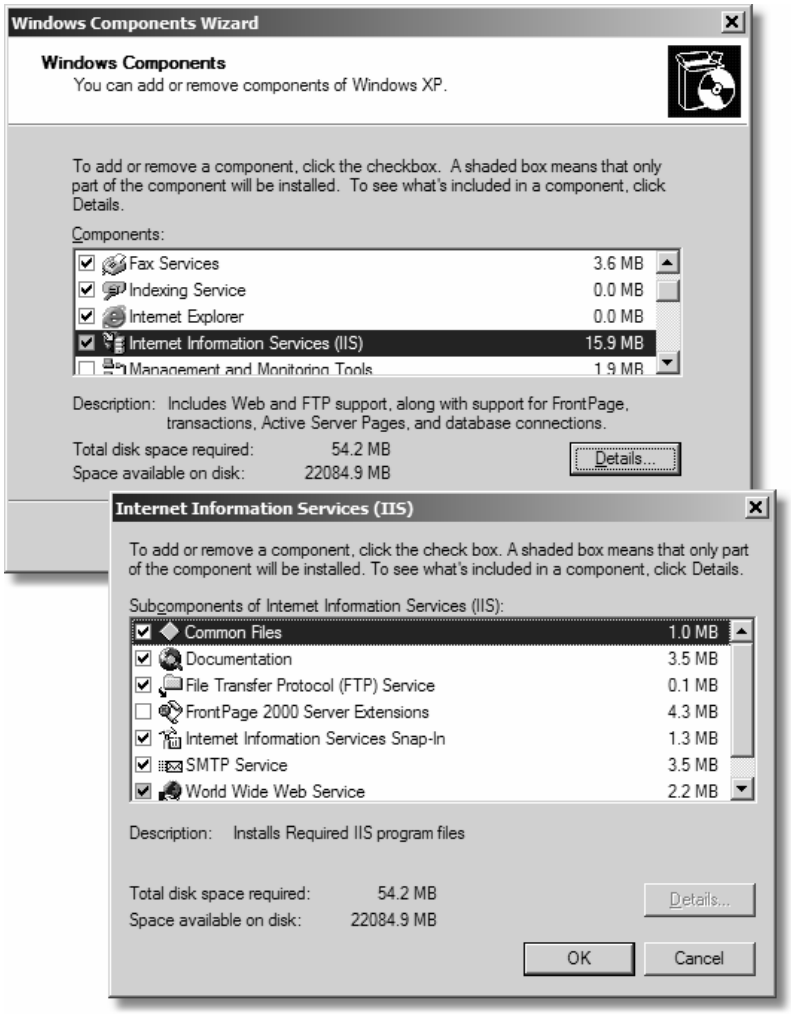
To check whether IIS are installed on your computer, double click on the item 'Add or Remove Programs' on the control panel (the window might look slightly different on your computer).



Click on 'Add/Remove Windows Components', and a window presenting an overview of the Windows components currently installed on your computer will then pop up (see the snapshot below). If the item ***Internet Information Services (IIS)*** is not checked, this means that IIS are not installed, otherwise this means that all internet services are properly installed.

The only thing we are actually interested in is the web server. If you click on the button 'Details…', a detailed overview of the Internet Information Services (IIS) will be shown as presented below. Enable/check the item 'World Wide Web Service' (web server in other words) and click on 'OK' (note that the item 'Common Files' will be checked automatically as well).

A short installation sequence requiring your Windows XP Pro CD will then run. When completed, the Microsoft web server will be installed on your computer, and you can then start the M-Vision server installation process.



Modem for M-Vision server

The M-Vision server can be accessed by an M-Vision client application in two ways:

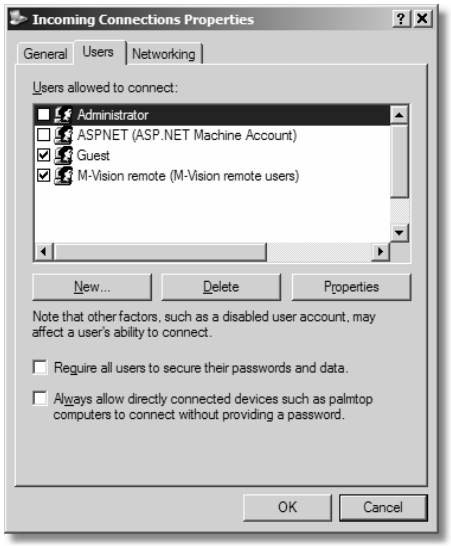
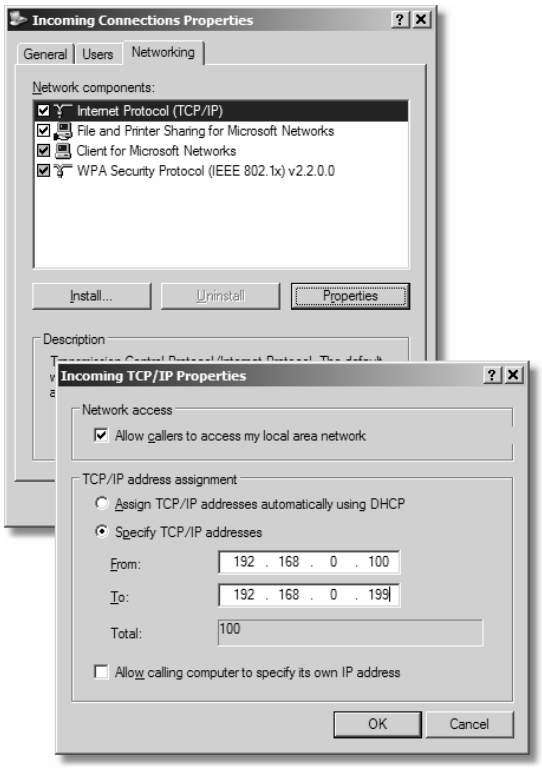
- Modem
- 'Standard' network or LAN (wired)

Below a short presentation of the different steps required to configure a modem to accept incoming calls and establish a network (TCP/IP) connection with a remote application.

1. Install the modem by using the installation CD delivered with the modem and/or the plug and play facilities provided by Windows. Skip this step, if the modem to be used for incoming connections is already properly installed.
2. Double click on 'Network Connections' (Windows XP).
3. Double click on 'New connection wizard' (Windows XP) and click on 'Next>'.
4. If you are using Windows XP, select the item 'Set up an advanced connection' and click on 'Next>'.
5. Select 'Accept Incoming Connections', and click on 'Next>'.
6. Select the modem which is to be used to accept the incoming connections and click on 'Next>'.
7. Select 'Do not allow virtual private connections' (not used in this context and therefore irrelevant) and click on 'Next>'.
8. Define a new user or select an existing user from the user list, who will be allowed to access the system. It is safest to define a new user, dedicated to M-Vision connection. Whether a new user or an existing user is chosen, remember the user name and the password, as these will be used on the remote side when calling in. Click on 'Next>'. The users accessing the server by modem will need this user name/password combination to be granted access.
9. Make sure that at least 'Internet Protocol (TCP/IP)' is selected in the 'Network components' dialog box. Click on 'Next>' and terminate the wizard by clicking on 'Finish'.

The network connection is completed, and the server computer is now ready to accept incoming calls from remote users.

NOTE:
The modem is now active and used permanently, for which reason it cannot be used by other applications.

You can change the user or add more users by invoking the properties of the incoming connection you have defined (control panel>Network connections, right click on the item 'Incoming Connection' and select 'Properties').	
You can change the TCP/IP properties by invoking the properties of the incoming connection you have defined (control panel>Network connections, right click on the item 'Incoming Connection' and select 'Properties'). This is a rather technical matter, and the default behaviour is that a remote application will automatically be assigned an IP address (item 'Assign TCP/IP addresses automatically using DHCP' is selected). You can also define a specific IP address range, e.g. the remote computers establishing a TCP/IP connection will get an IP address in a predefined range (between 192.168.0.100 and 192.168.0.199 on the snapshot on the right, where 192.168.0.100 will be used as the IP address of the server as far as the modem is concerned). Defining the IP addresses can be necessary if the server is not already on a local area network (LAN).	

Modem for M-Vision client

In order to access an M-Vision server through a modem, you have to go through the following steps:

1. Install the modem by using the installation CD delivered with the modem and/or the plug and play facilities provided by Windows. Skip this step, if the modem to be used for calling is already properly installed.
2. Double click on 'Network Connections' (Windows XP) in the control panel.
3. Double click on 'New connection wizard' (Windows XP) and click on 'Next>'.
4. Select 'Connect to the internet' (Windows XP).
5. If you are using Windows XP, select the item 'Set up my connection manually' and click on 'Next>'.
6. If you are using Windows XP, select the item 'Connect using a dial-up modem' and click on 'Next>'.
7. Select the modem you intend to use to call the server and click on 'Next>'.
8. If you are using Windows XP, enter the name you want to assign to this dial-up connection in the field 'ISP name' (this field is just used to name the connection when the wizard finishes) and click on 'Next>'.
9. Enter the telephone number of the server in the field 'Phone number' and click on 'Next>'. The telephone number should be known by the site or project manager.
10. If you use Windows XP, you can define the user name and password required to be granted access to the server. Uncheck the three items below the field 'Confirm password', as these items are irrelevant. Click on 'Next>'.
11. If you are using Windows XP, click on 'Finish'.

The network connection is now completed, and in order to establish the connection with the server (dial-up), you will have to launch manually before attempting to communicate with the server. Always use the user name and password which have been defined on the server, and which should be known by the project or site manager.

4. Terminology

- Application:

This is a common and general term used to describe a program consisting of an executable file and possibly several additional files such as modules, configuration files etc.

- Client-server application:

A server application provides a set of predefined services, which can be used or consumed by a client application. These services are publicly available and can be used locally or across a network. These services are run on the server, and the client will only get the result back when completed. In case of a report, data are processed and properly formatted on the server, and the result is forwarded to the client which initiated the report request.

- Trending and trending component:

Trending is the ability to follow a set of values across time, and a trending component provides the possibility of visualising this/these value(s) as graphs.

- Report:

A report is a kind of data snapshot from a database, a presentation template and possibly a few parameters, which can be used to limit the size of a report or perform a finer search.

- OPC:

OPC is a series of standard specifications resulting from the collaboration of a number of leading worldwide automation suppliers working with Microsoft. OPC defines a standard set of objects, interfaces and methods for use in process control and manufacturing automation applications to facilitate interoperability. The two major specifications are "OPC Data Access", which basically defines how to read/write and interact with a process, and "OPC Alarms and Events", which defines how to handle alarms issued by a process.

- Communication protocol:

Most industrial controllers have the possibility of delivering data to the outside world, so that a user can read a set of values such as measurements and status, as well as write values such as set points. This reading/writing capability is provided by a communication protocol, defining how and what a user can read/write.

- Modbus:

This is probably one of the most commonly used communication protocols in the industry. The Modbus protocol has several variants.

- Mimic:

Creating a mimic is to be understood as building an understandable graphical presentation of a process, which to the widest possible extent must look like the real process.

- Data logger:

Module or application which logs or saves data to a database. Data to be saved (measurement values) and the periodicity are predefined.

- MS Access and Excel:

These are two well-known applications from Microsoft. Access is a database application (design, use and maintenance of Access databases), and Excel is a spreadsheet application.

- Tag:

General term used to design a value or measurement in an industrial process, such as a voltage, a frequency, a status or a set point. Depending on the type of a tag, one often speaks of integer tags (integer values), float tags (floating point values), Boolean tags (true/false tags).