MITSUBISHI ELECTRIC

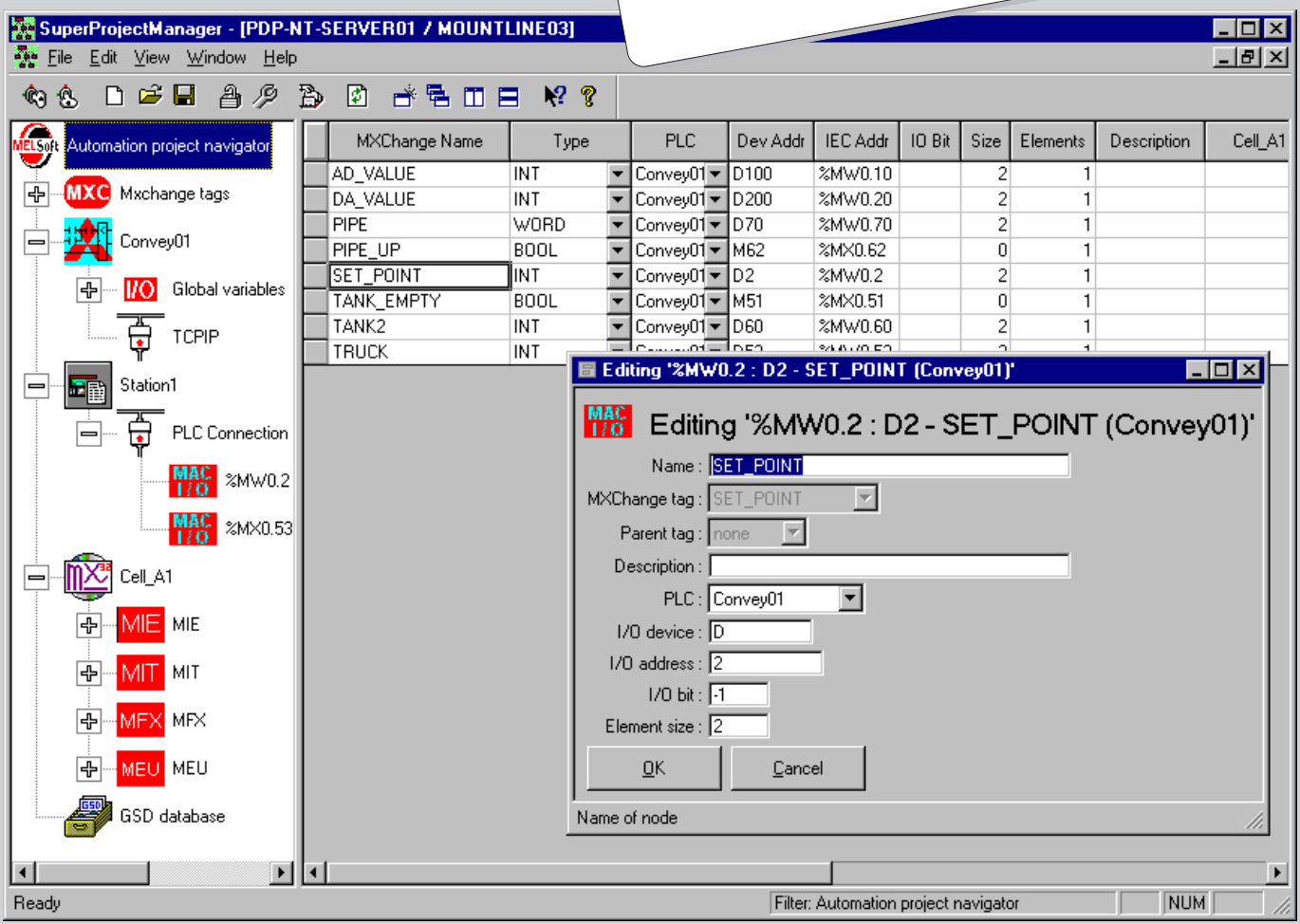
Info ON

MXChange

Automation Project Manager

Index

Software Manual



MXChange v1.1

Automation Project Manager

Software Manual

About this Manual

The texts and illustrations in this manual are provided exclusively as a guide to the **MXChange** integration system for automation development tools. Separate manuals are available for automation development tools like MELSEC MEDOC *plus*, MELSEC ProfiMap, MAC programmer+, and MX SCADA.

The MXChange software is supplied under a legal license agreement and may only be used and copied subject to the terms of this License Agreement.

MITSUBISHI ELECTRIC reserves the right to make changes to the technical specifications and information in this manual at any time and without prior notice.

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1 Introduction

1.1 Software purpose

MXChange is designed to integrate MITSUBISHI ELECTRIC automation development tools into a single environment which harmonises programming, supervision, network configuration, and simulation components.

Examples:

- **MELSEC MEDOC *plus***
  IEC 1131-3 programming and documentation system providing the user with facilities for structured programming for MELSEC PLC including function blocks
- **ProfiMap**
  Visual configuration software package for open networks such as PROFIBUS DP, PROFIBUS FMS, and MAP 3.0
- **MX32 SCADA**
  Process visualisation and supervisory system
- **MAC Programmer+**
  Visual programming tool for operator terminals

1.2 General features

MXChange provides the following features:

- Simultaneous definition of I/O references in multiple packages and projects
- Automatic transfer of changes of I/O references to other parts of the automation project
- Automatic transfer of ProfiMap POU blocks to the corresponding MELSEC MEDOC *plus* projects
- Import and export of parts of the MXChange configuration for use with other MXChange servers
- Import and export in Microsoft Excel compatible format (CSV)
- Simultaneous generation of multiple tags for all projects based on a supplied pattern
- Synchronisation mechanism
- Security mechanism with log in and password

1.3 This manual is a compact guide...

... to use **MXChange** suitable for experienced users and factory automation programmers. The manual explains the terms and structural concepts of the software and describes how to use MXChange including sample projects.

1.4 If you are not yet familiar with MS Windows ...

... please read the Windows Fundamentals section in the Windows User's Guide or work through the Windows Tutorial accessible via the **Help** function in the Windows **Start** menu.

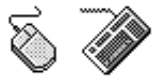
1.5 If you encounter any problems...

... or if you have questions concerning MXChange or the automation development tools to be integrated, please first refer to the manuals. Many answers and solutions can also be found directly in the MXChange context-sensitive online help system, which can always be accessed by pressing F1. Make use of the **Index** command in the **Help** menu as well, as this will often locate the information you need. If you do not find any answers, contact your local MITSUBISHI ELECTRIC representative or call our European headquarters in Ratingen directly.

1.6 Typographic conventions and other hints

Menu names, menu commands, submenu commands, and dialog box options are printed in **boldface** type.

Buttons are generally presented in the same way as they appear in the window (e.g. OK Cancel).



These two symbols are used to identify the separate instructions for mouse and keyboard users.

Examples: *This symbol identifies examples.*

Note: *This symbol draws your attention to notes, hints and valuable or useful information.*

WARNING: *Always pay particular attention to the warnings marked by this symbol. If you do not follow these instructions, data loss, hardware damages, or other serious problems may be caused.*

This symbol draws your attention to additional information.

2 Installation

2.1 System requirements

To install the MXChange software package, your computer has to meet the following requirements.

2.1.1 Minimum hardware configuration

- Pentium class PC
- 64 MB RAM
- Hard disk with at least 40 MB free space
- CD-ROM drive
- SVGA compatible graphics adapter
- Mouse

2.1.2 Software requirements

The software runs on the following graphical operating systems:

- MS Windows 95 or 98
- MS Windows NT v4.0 with Service Pack 4 or higher
- MS Windows 3.11 - for the stand-alone 16-bit Tag Editor only
- Installed TCP/IP network protocol (included in MS Windows)
  Refer to the MS Windows manuals or online help for the installation of the TCP/IP network protocol.

2.2 Copyright

2.3 Software installation

2.3.1 MXChange software setup

The MXChange software package contains the following programs:

- 32-bit **MXChange server** for MS Windows 95/98 and NT
- 32-bit **MXChange tools** including the **Super Project Manager** with integrated **Tag Editor** for MS Windows 95/98 and NT
- 32-bit **MX Interface** for MS Windows 95/98 and NT
- 16-bit MXChange Tag Editor - stand-alone version for MS Windows 3.11

To install the MXChange software from CD-ROM under MS Windows 95/98, you need to have MS Windows installed properly. For an installation under Windows NT you need to be logged in with administrator privileges.

Please close all other running software and installation programs before installing MXChange.

2.3.2 Button functions

You will leave the current menu and enter the next menu.

You will go to the previous menu.

You will abort the installation procedure.

2.3.3 Installing MXChange on your hard disk

The **MXChange server**, the **MXChange tools**, and the **MX Interface** are delivered on one CD-ROM and are installed by one combined installer. You can select three different setup types: **Typical**, **compact**, and **custom**.

To start the installation, proceed as follows:

① Start Windows.

② Insert the CD-ROM into your CD-ROM drive.

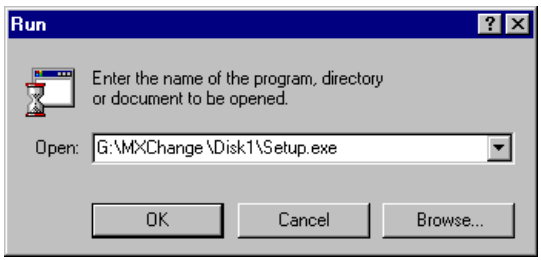
③ Execute the **Setup.exe** file from the CD-ROM. The Setup.exe file is located in:

MyCDROM:\MXChange\Disk1\Setup.exe

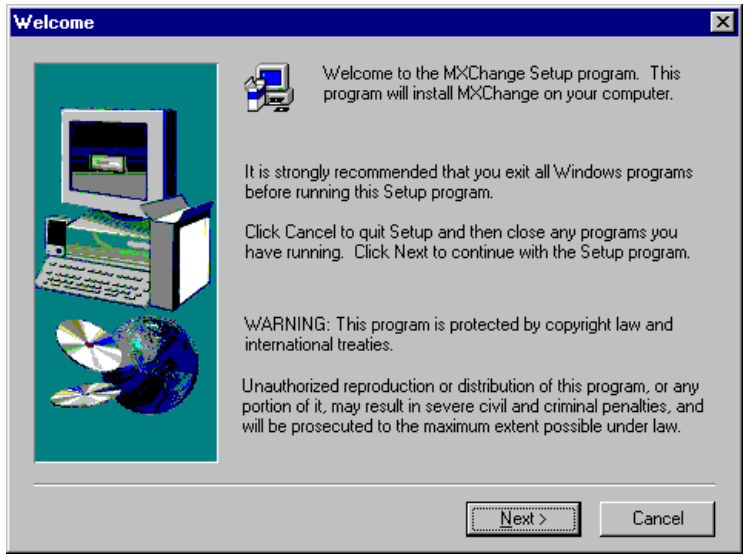
- Double-click on the **setup.exe** file within the **Explorer**

  or

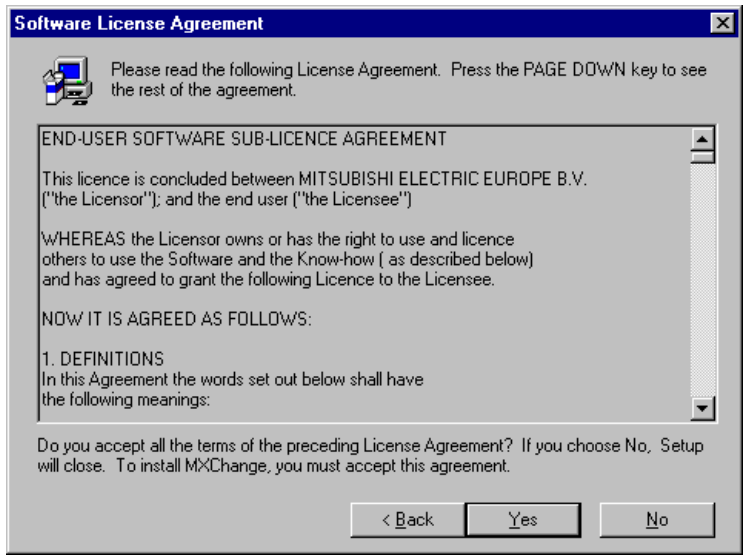
- select the **Run** command from the **Windows Start** menu and enter the desired path where "MyCDROM" is the drive letter:



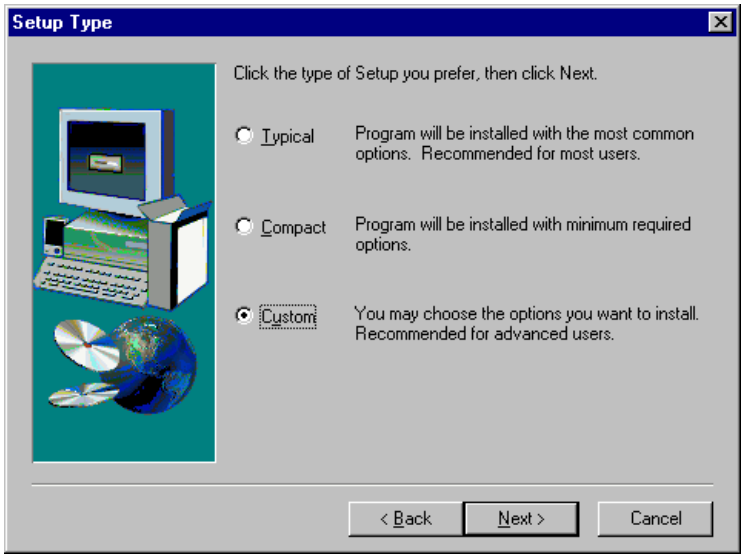
④ Follow the instructions guiding you through the installation:



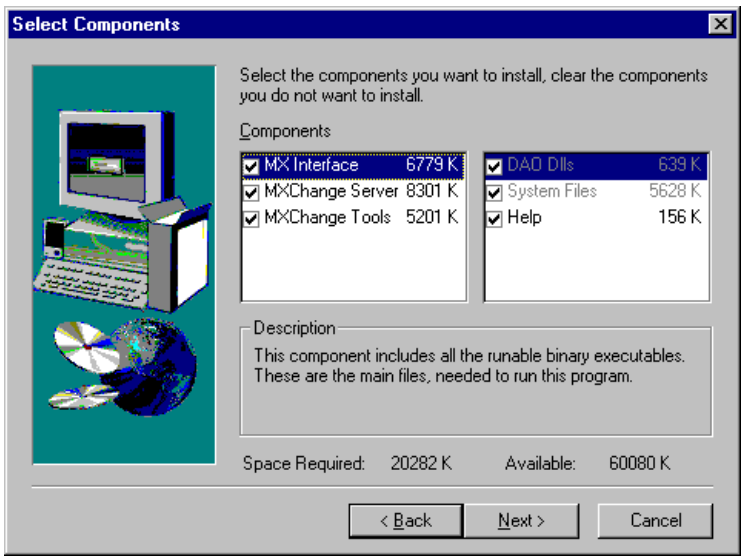
⑤ Read carefully through the license agreement and follow the instructions given:



⑥ Select the desired installation type. The default setting is **Typical**. If you choose **Typical** or **Compact**, you will proceed with step ⑧. The **Custom** setup lets you choose the components to be installed individually.

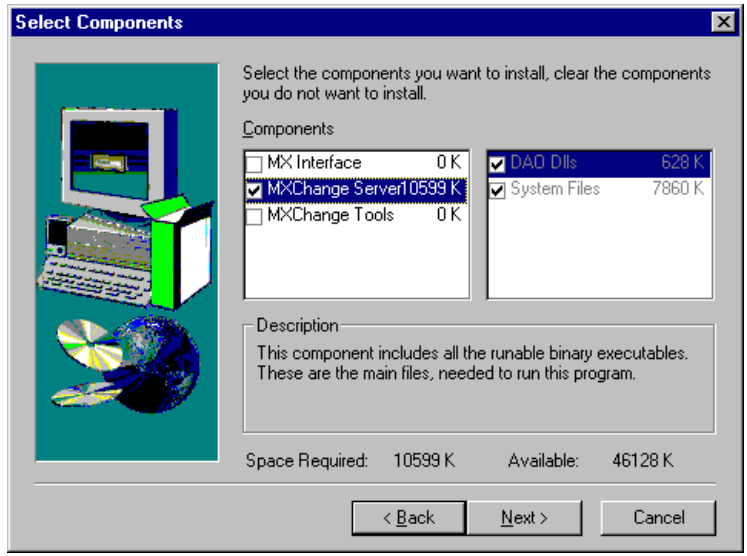


⑦ Click on the checkboxes to deselect or select individual items:



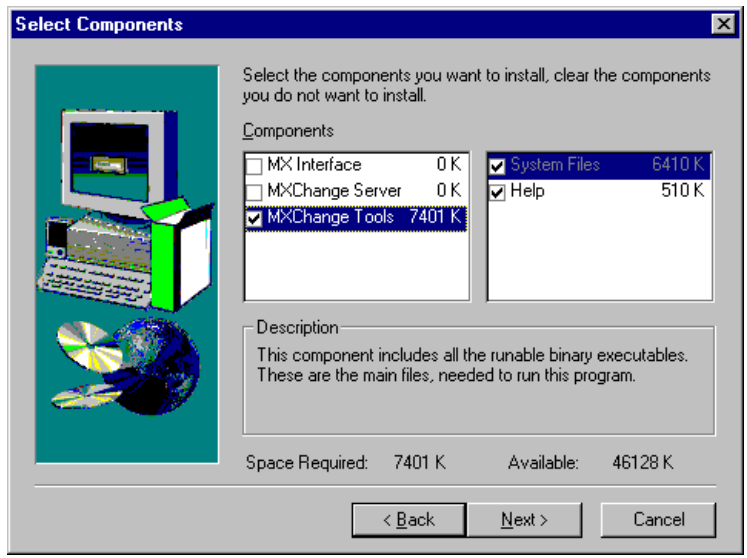
A. Install the MXChange server only

At least one MXChange server installation is compulsory across your TCP/IP network or on your local computer. The MXChange server provides the connectivity between your automation development tools.



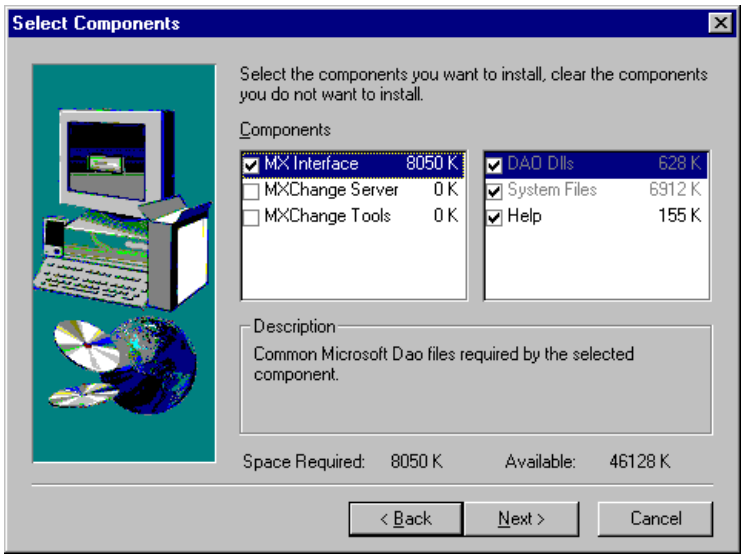
B. Install the MXChange tools only

The MXChange tools include the Super Project Manager with which you can maintain your common databases.

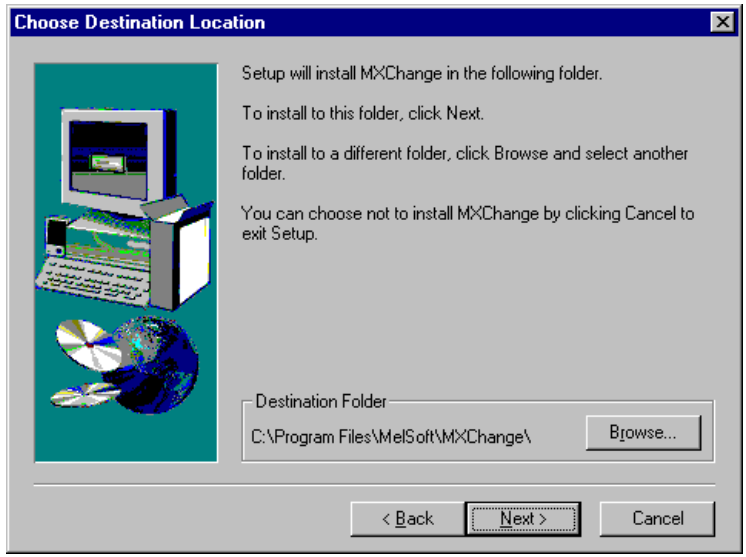


C. Install the MX Interface only

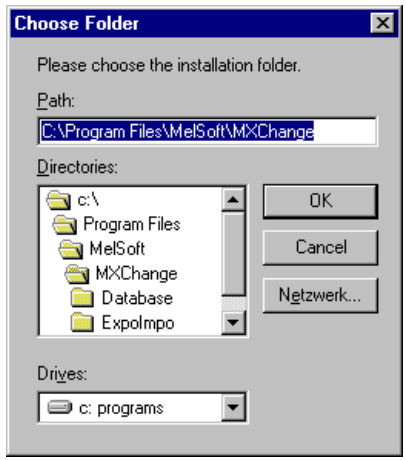
The MX Interface is only needed for a connection to MX SCADA.



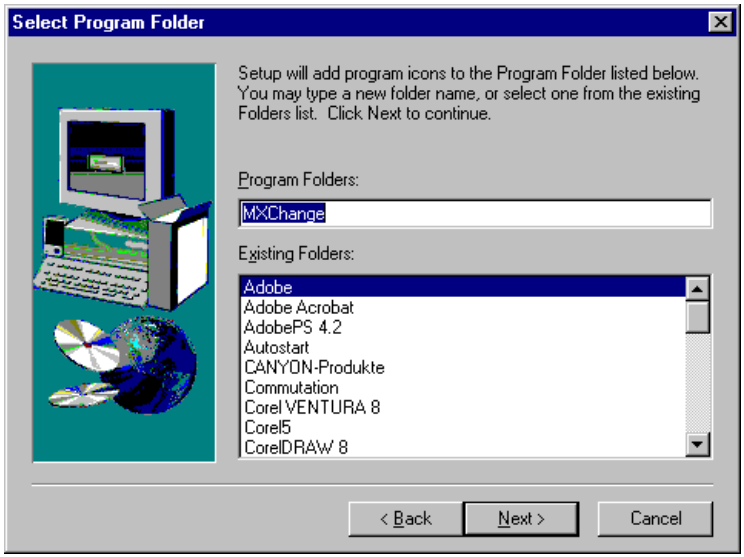
⑧ The default destination folder is shown below:



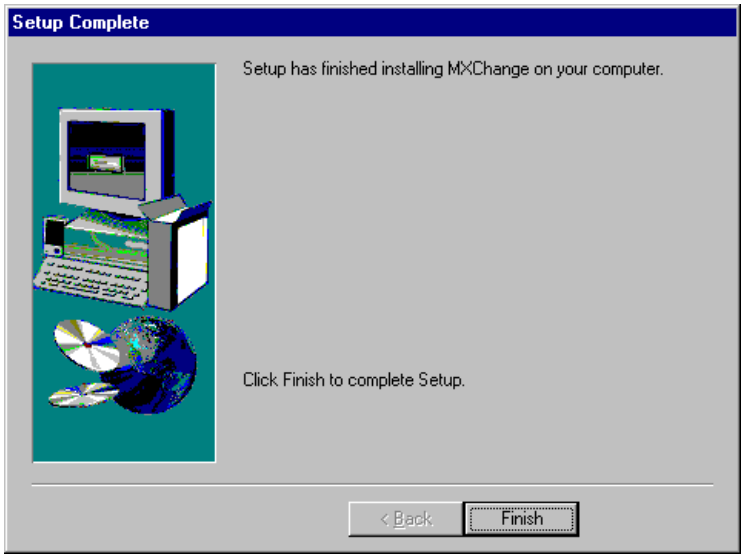
⑨ You can change the destination folder by clicking on the **Browse** button:



⑩ The default program folder is shown below. You can select another program folder from the listbox or enter a new one in the entry field:



⑪ The MXChange installation is complete:

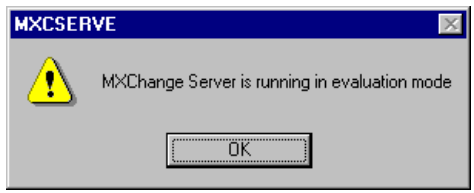


2.3.4 Dongle protection

The software is copy protected via a hardware dongle included in the software package. Plug the hardware dongle on the parallel port of your personal computer. The signals of the port are connected through, so you can connect parallel peripherals (e.g. printers) to the dongle.

Without the dongle connected, MXChange will only run in **evaluation mode** with the following restrictions:

- Maximum of 20 tags
- No network capabilities (stand alone system only)
- Only one server instance per computer



For the installation you do not need the dongle.

2.3.5 Installing the external Tag Editor (16-bit) on your hard disk

The external Tag Editor (16-bit) is intended for personal computers running MS Windows 3.11.

To start the installation, proceed as follows:

① Start Windows.

② Insert the CD-ROM into your CD-ROM drive.

③ Execute the **Setup.exe** file from the CD-ROM. The Setup.exe file is located in:

MyCDROM:\mxchange\disk1\setup.exe
"MyCDROM" is the drive letter of your CD-ROM drive.

Double-click on the setup.exe file within the **File Manager.**

④ Follow the instructions of the **InstallShield Wizard** guiding you through the installation.

⑤ Specify the destination directory.
The default path is:

C:\programf\melsoft\mxchange

⑥ Specify the program folder the MXChange icons are added to.
The default program folder is **MXChange**

3 System Description

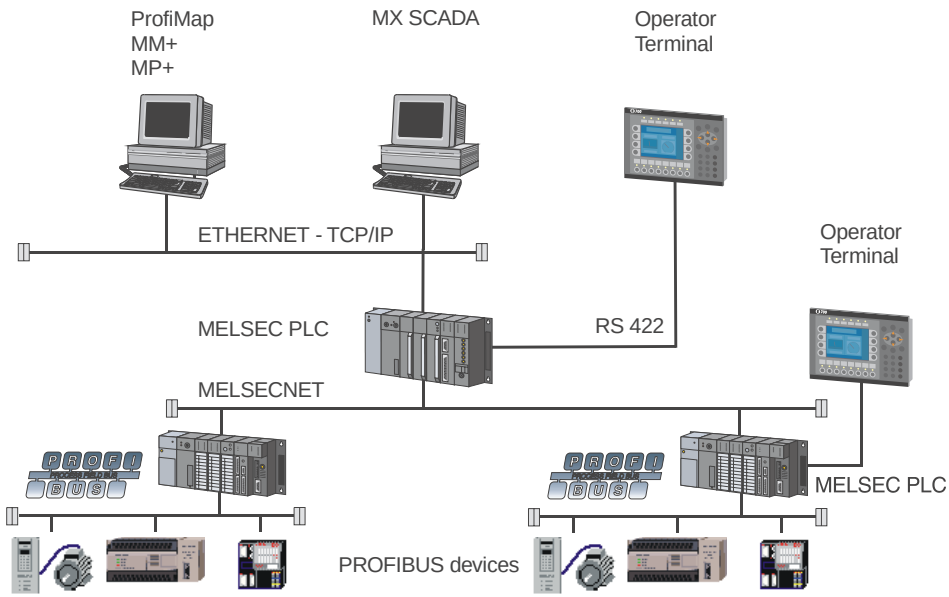
3.1 System concept

MXChange provides an integrated development environment which integrates the programming and configuration tools.

MXChange:

- reduces the development time of an application consisting of several automation components (i.e. PLCs, HMIs, SCADAs, and networks).
- removes the need to configure the same data in more than one package.
- reduces the number of operator input errors.

A typical distributed control system is shown in the diagram below:



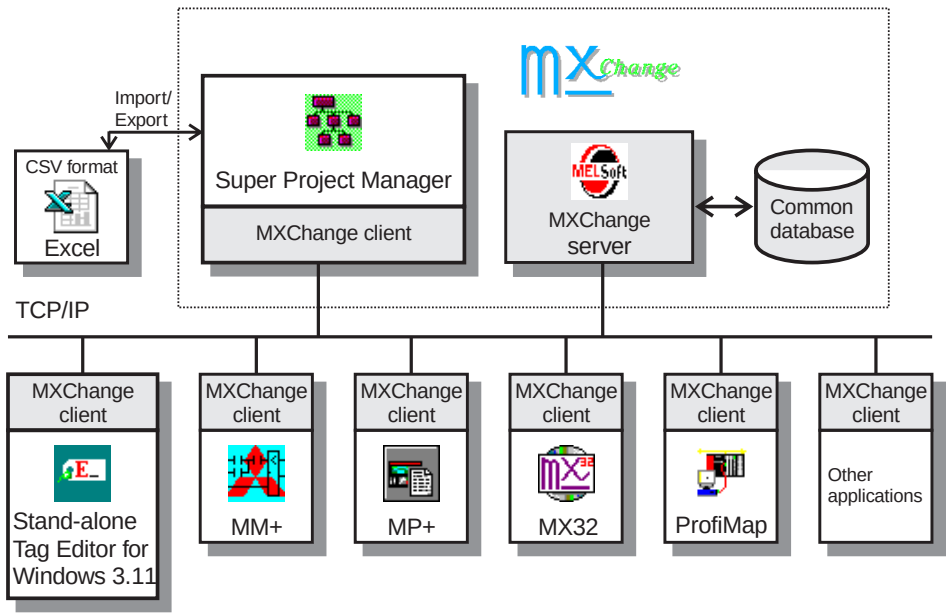
In this diagram a networked PLC system controls many devices on a PROFIBUS network configured with **ProfiMap**. Several **MX SCADA** PCs and operator terminals are provided for operator display and control. The configuration programs for each part of the system are on different PCs.

Although all these PLC systems share the same I/O and network, each configuration program operates independently, i.e. that every I/O reference must be defined separately in each package. This is time-consuming and there is the potential for typing errors and configuration mismatches which can be costly to track down and repair.

MXChange provides a way for the configuration packages to co-operate, allowing the definition of I/O references in several programs at the same time. If an I/O address is changed in one package, the change is propagated automatically to the other packages.

3.2 Architecture

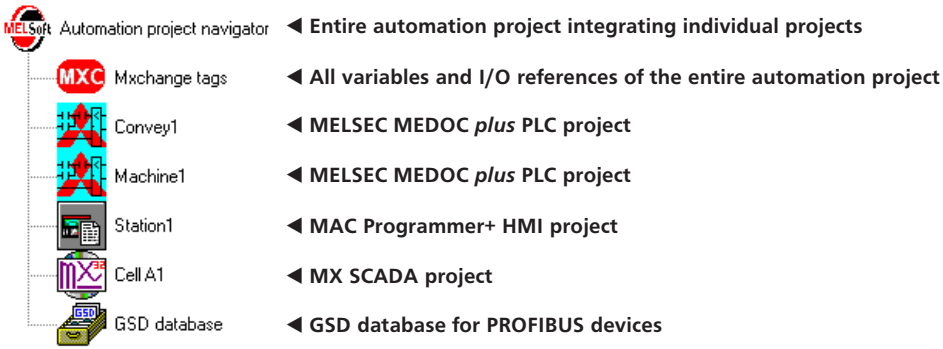
The overall architecture of MXChange is shown in the diagram below:



The system has a client/server architecture. Each of the configuration programs is modified to communicate with a common database server. All communications are performed via the server. The Super Project Manager it able to export data to programs like Excel.

3.3 Use

An **automation project** is setup by adding all individual projects and programs to it (e.g. PLC programs and HMI projects). The entire automation project is a hierarchical tree where the individual projects and programs are the **nodes**. Each individual node may further branch off containing for example local I/Os, communications cards, or device drivers.



Note: *The term* **node** *in general refers to the connecting points that form a tree structure. MXChange represents an entire automation project as a hierarchical tree consisting of nodes. Any item displayed in the project tree is a node. Each single node represents an individual PLC program, HMI project, I/O communications point, device driver, etc.*

When variable names or I/O points are added to the system in any configuration package, the user can declare them as **MXChange tags**. Limited information about MXChange tags (e.g. name, description, address) is stored in the **MXChange common database**, as well as in the project or program where it was defined. The user is automatically asked whether the tag should be created in the other automation projects connected as well. When the MXChange tag is created, the user is prompted for any details which are needed by the other target projects, but which are not available in the configuration package where the tag was defined. If any detail can be calculated automatically, the user is not prompted for it. There are also reasonable default values for all fields.

Changes may be for the addition or modification not only of MXChange tags but also for more specific changes such as the export of a new **POU block** from ProfiMap to MELSEC MEDOC *plus*.

When an MXChange tag is deleted, the system prompts to see whether the tag should also be deleted in other applications. The tag will be removed from MXChange only when it no longer appears in any other configuration program.

Whenever possible, changes to one application are passed on to all other running applications. However, if the user has disabled this option, changes will be dealt with only on start-up and save. Communication always occurs via the MXChange server.

Note: *If the MXChange server is not available, applications will back up any changes locally to retransmit to the server when it is online again.*

4 Getting started

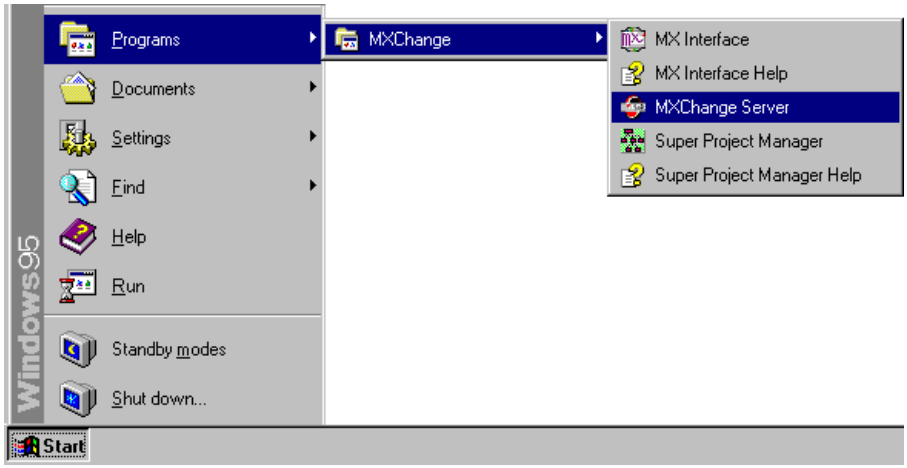
The following example shows the principles of how you can easily establish an automation project by adding your projects to the Super Project Manager.

4.1 Integrating a MELSEC MEDOC *plus* project in MXChange

This chapter describes how to link an existing MELSEC MEDOC *plus* project into the common database of MXChange.

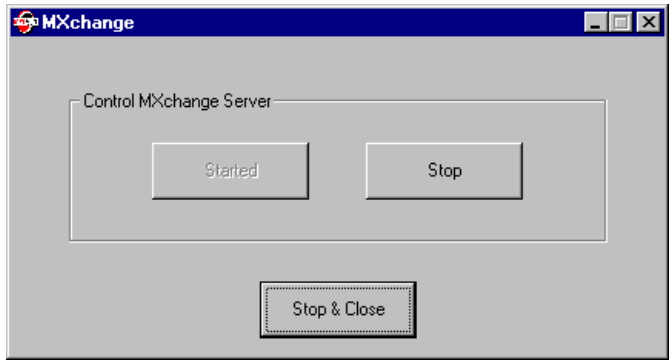
1. Start the MXChange server

Click on Start to open the Windows **Start** menu and select the menu item **Programs/MXChange/MXChange Server**.



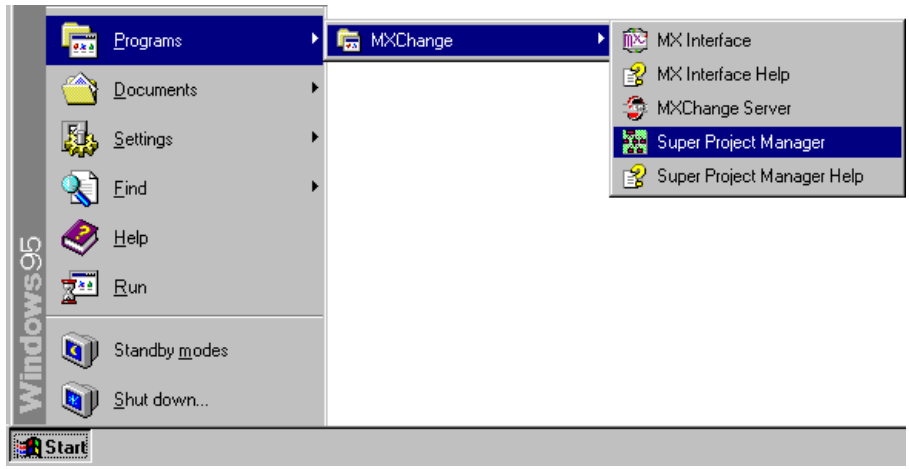
Start the MXChange server either on your local personal computer or on a different one you are connected to via the TCP/IP protocol.

Once the MXChange server is running, it does not need any further setup or maintenance. Therefore, you can minimise it but let it run in the background.

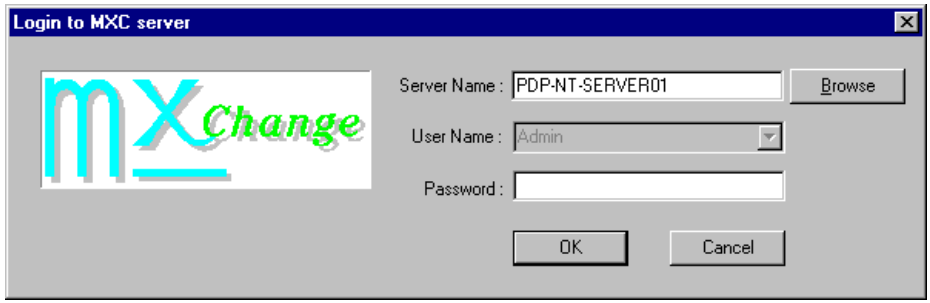


2. Start the Super Project Manager and login

Click on Start to open the Windows **Start** menu and select the menu item **Programs/MXChange/Super Project Manager**.



The **Login to MXChange server** dialog appears automatically:



The **User Name** cannot be changed and is fixed to **Admin**.

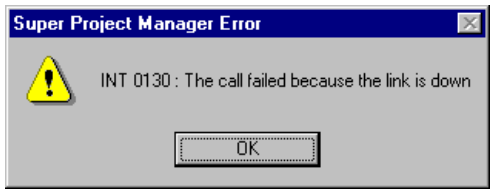
The default **Password** is "" (leave it blank).

- Confirm by clicking OK.

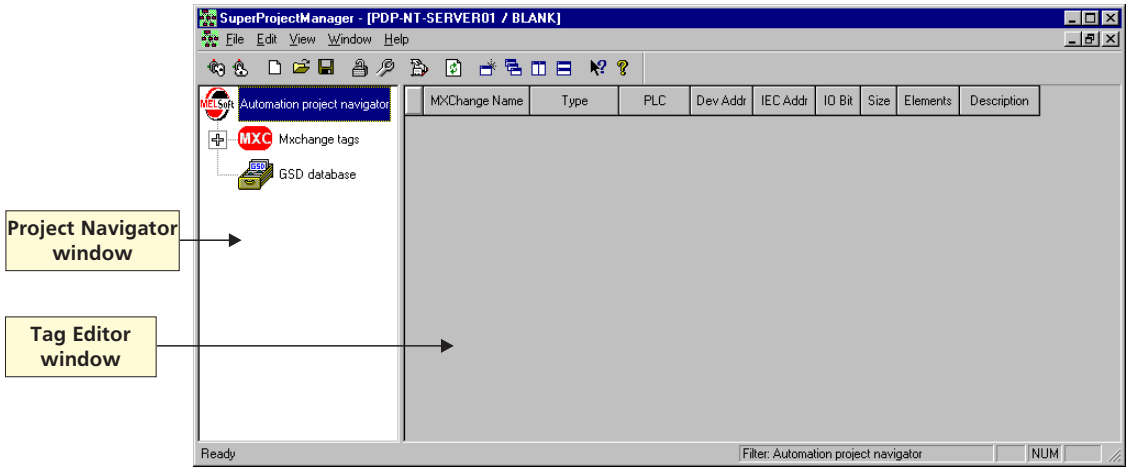
Note: *Upper-case and lower-case characters are distinguished by the MXChange server.*

The Super Project Manager tries to establish the connection to the server.

If there is no **MXChange server** started on the selected personal computer, an error message is returned:



If the connection is established, the Super Project Manager appears:

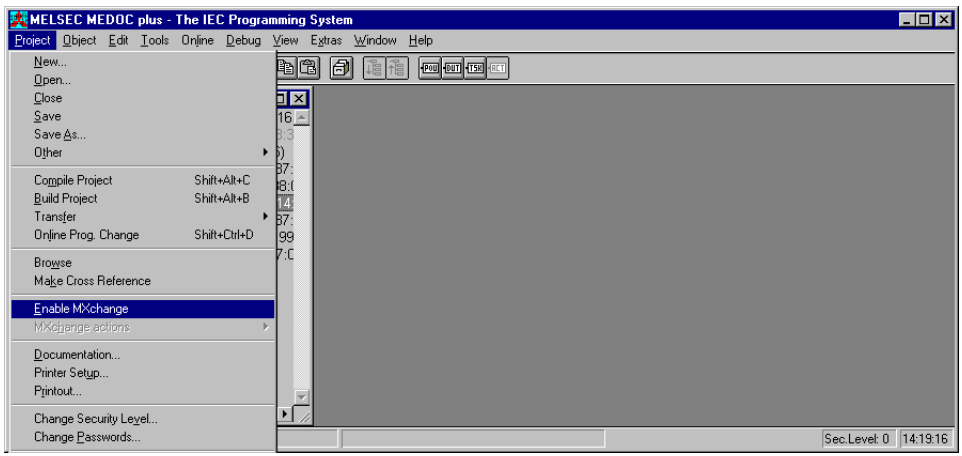


The **Project Navigator** window on the left shows all projects connected to MXChange as a tree of hierarchical nodes.

The **Tag Editor** window on the right (here still blank) lists all tags of different projects to be used with MXChange.

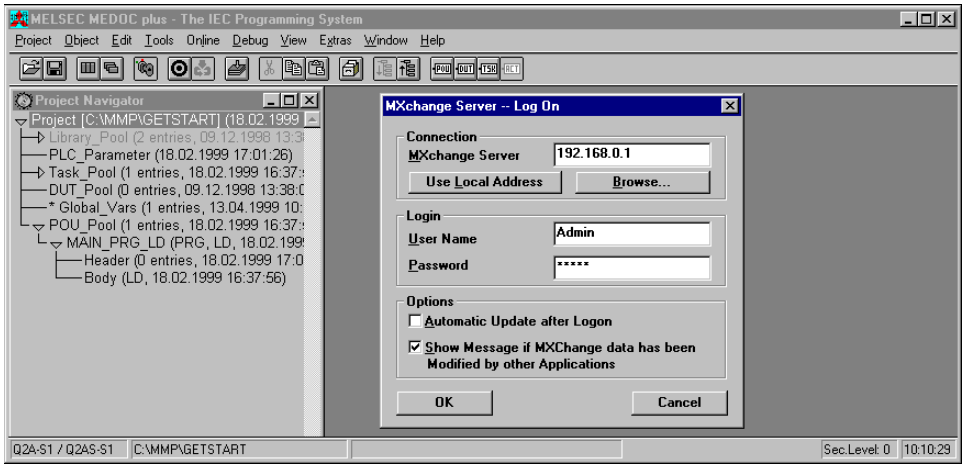
3. Open MELSEC MEDOC *plus* project and log on

To connect a MELSEC MEDOC *plus* project to MXChange for the first time, create a MELSEC MEDOC *plus* project called **GETSTART**. Refer to the MELSEC MEDOC *plus* manual for details. Open this project and enable the MXChange support:



For activating the MXChange feature, refer to the manual of your automation software.

The **MXChange server - Log On** dialog appears automatically:



Enter **MXChange Server**, **User Name**, and **Password**:

MXChange Server: The TCP/IP address of the personal computer where the MXChange server is running.
If the server is running locally, click on **Use Local Address** for the TCP/IP address of your local personal computer.

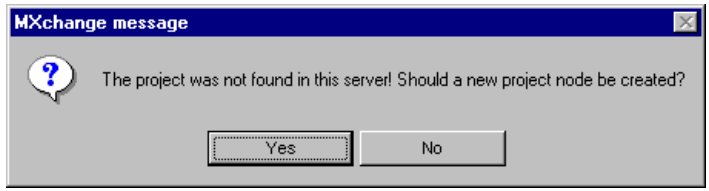
The defaults for the user name and password are:

User Name: **Admin**
Password: **""** (leave it blank).

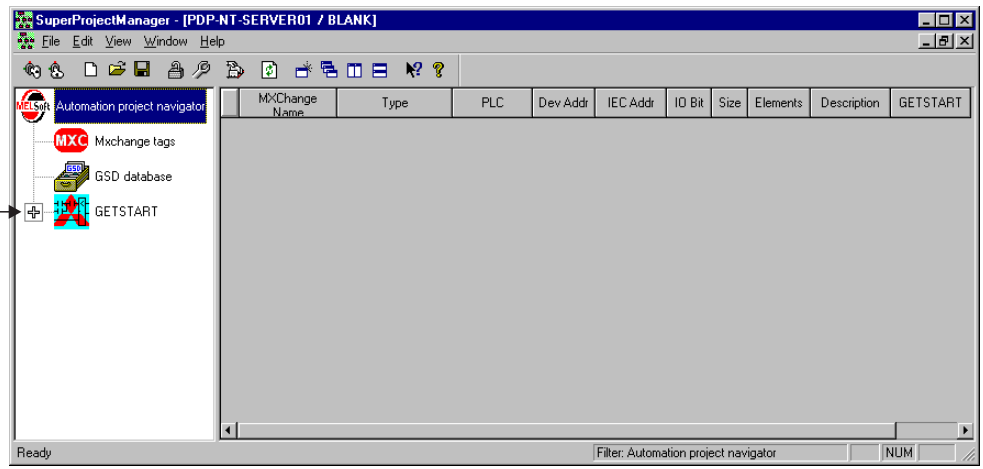
Note: *Upper-case and lower-case characters are distinguished by the MXChange server.*

4. Add the MELSEC MEDOC *plus* project to MXChange

As your MELSEC MEDOC *plus* project is connected to the server, MXChange notes that this project does not exist in the common database and asks whether you want to add it:

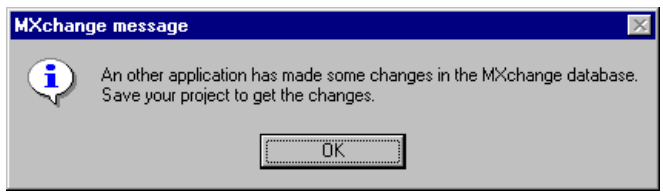


confirm by clicking Yes and the MELSEC MEDOC *plus* project will be added to the Project Navigator of the Super Project Manager:



MELSEC MEDOC *plus* project

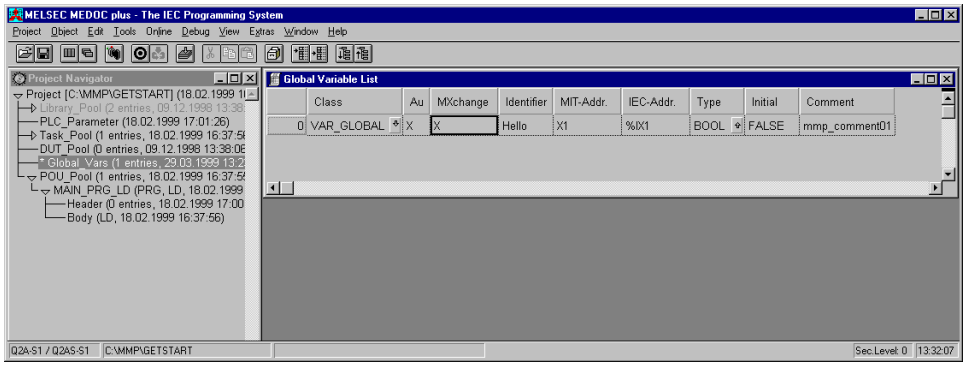
As you have made some changes in the common database, MXChange will inform the MELSEC MEDOC *plus* project about these changes. Any changes made in a project will be synchronised with MXChange when you save your project:



5. Tag MELSEC MEDOC *plus* variables for MXChange

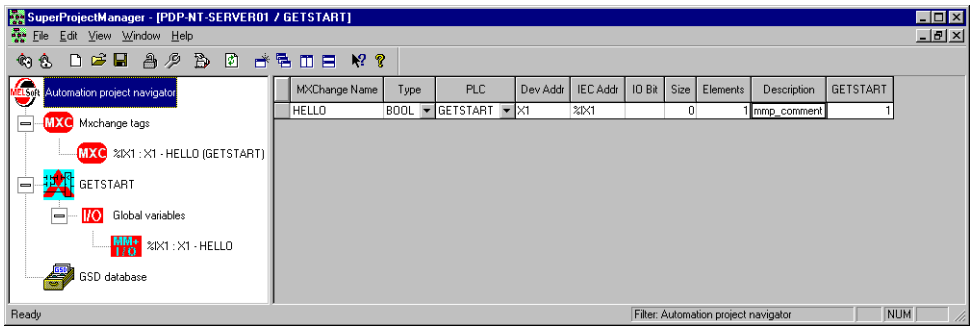
MXchange
X

Now specify the variable **Hello** to be included in the common database of MXChange. Open the MELSEC MEDOC *plus* **Global Variable List** and click on the **MXChange checkbox** of the variable **Hello**:



6. Tags are added to MXChange

After the MELSEC MEDOC *plus* variable **HELLO** has been tagged, save your MELSEC MEDOC *plus* project to transfer the changes to MXChange. The MELSEC MEDOC *plus* project automatically inserts an **MXChange tag** and a **MELSEC MEDOC *plus* tag**. The view is refreshed by clicking on in the Super Project Manager.



The first variable name **HELLO** is included in both, the MELSEC MEDOC *plus* project and the MXChange tags in the Super Project Manager.

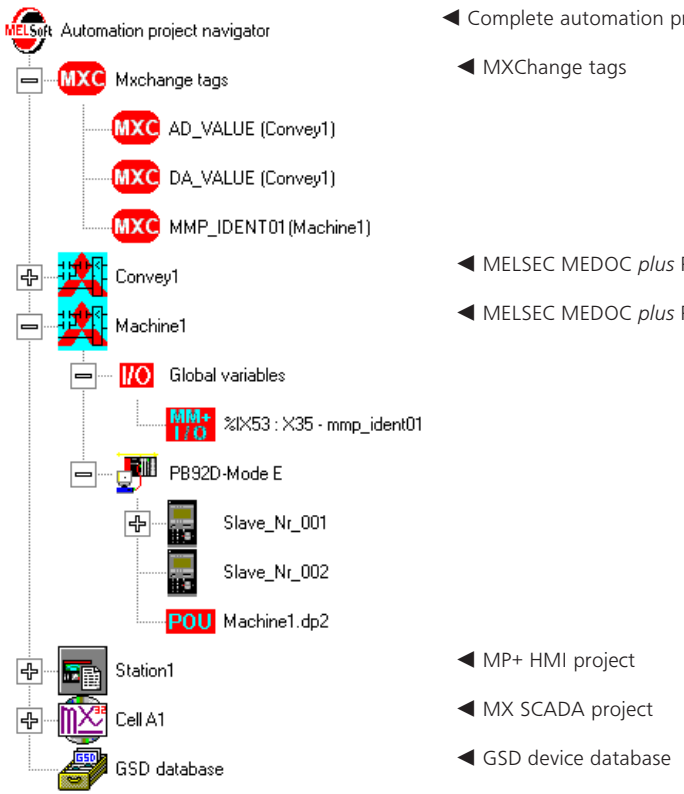
Note: *Any changes you have made in the PLC project within MELSEC MEDOC* plus *are transferred to MXChange only if you* **save** *the PLC project.*

5 Super Project Manager

The Super Project Manager is the main interface between the user and the MXChange server. The Super Project Manager is the central tool that lets you manage different automation projects from just one single common interface.

5.1 Hierarchical structure

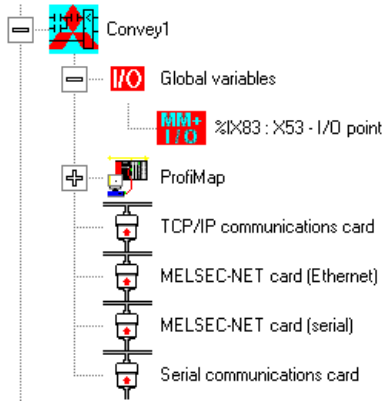
The Super Project Manager provides an overview of the complete automation project. The Super Project Manager provides a hierarchical structure consisting of nodes:



By means of the hierarchical structure you can copy and paste parts of the configuration to easily generate new MXChange tags from existing tags.

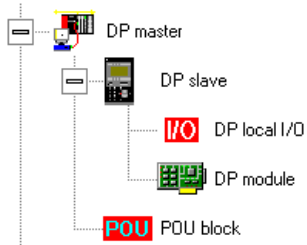
5.1.1 MELSEC MEDOC *plus* PLC project structure

Each MELSEC MEDOC *plus* project describes the configuration of a single PLC. To connect another package to the PLC, the package must know which CPU is used and which communications cards are attached. The hierarchichal structure stores this information.



DP configuration structure

A single DP master (I/O card) is a ProfiMap project. This describes a number of DP slaves and any I/O attached to them. At the simplest level, a DP slave can be seen as two ranges of memory mapped into the PLC, containing raw input and output data. I/O points may be defined within this data, in a similar way to the tags on other systems - they are not read individually, but are used as markers into the structure when creating the corresponding MELSEC MEDOC *plus* tags.



A list of known DP slaves is maintained in the MXChange database. New devices can be added by providing a GSD file, to determine the slave details and any modules which may be added to the device.

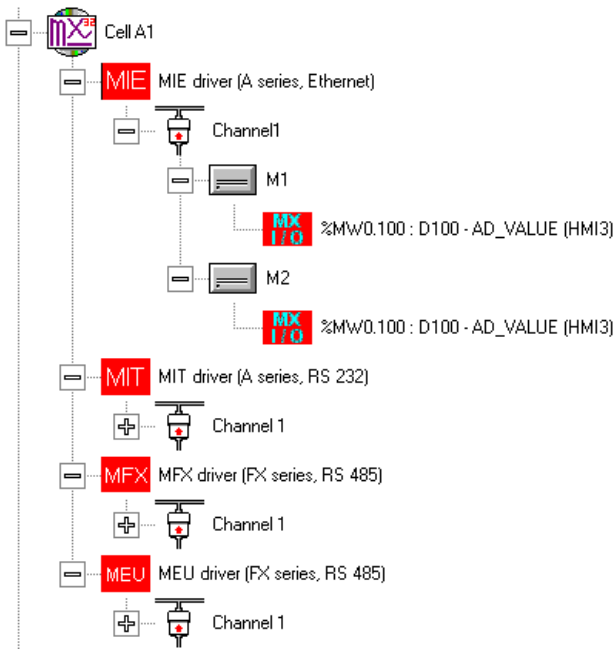
5.1.2 MP+ project structure

MP+ projects are structured as shown below:

Each device is subordered to the PLC connection to determine the communication with PLCs in a similar way to MX SCADA projects.

5.1.3 MX SCADA structure

To define an I/O point, MX SCADA needs to know which driver fetches the information and which channel and device are used.



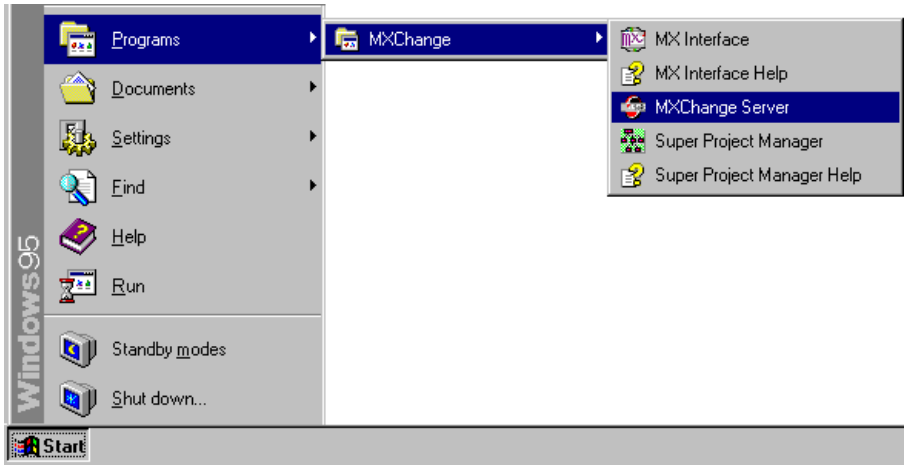
Although the channels and devices appear identically, there are different classes depending on whether Ethernet or serial communication is used. Ethernet drivers connect to a TCP/IP card in the PLC, whereas serial drivers connect to a CPU or serial communications card.

Note: *If you intend to connect a MELSEC MEDOC* plus *project and an MX SCADA project, ensure that the I/O card of the MELSEC MEDOC* plus *project corresponds to the MX driver and the respective channel and device of the MX SCADA project. The driver, channel, and device of the MX SCADA project must be added manually to MXChange.*

5.2 Starting the MXChange server

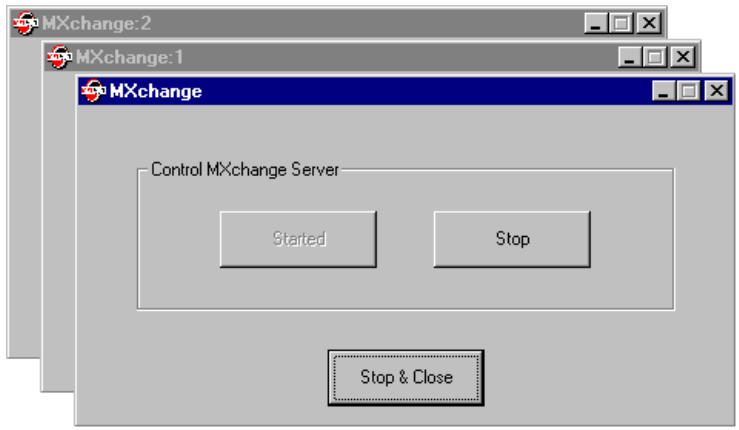
The MXChange server is the central interface between the software tools and the common database. When the MXChange server is started, it does not require any further setup or maintenance. The MXChange server must run either on the local personal computer or on a remote computer accessible via TCP/IP network.

Start the MXChange server from the MS Windows Start/Programs menu (or from where you installed it):



You can start more than one MXChange server on one single personal computer. Each MXChange server handles an individual database. The additional MXChange servers are numbered successively (Server:1, Server:2, ...).

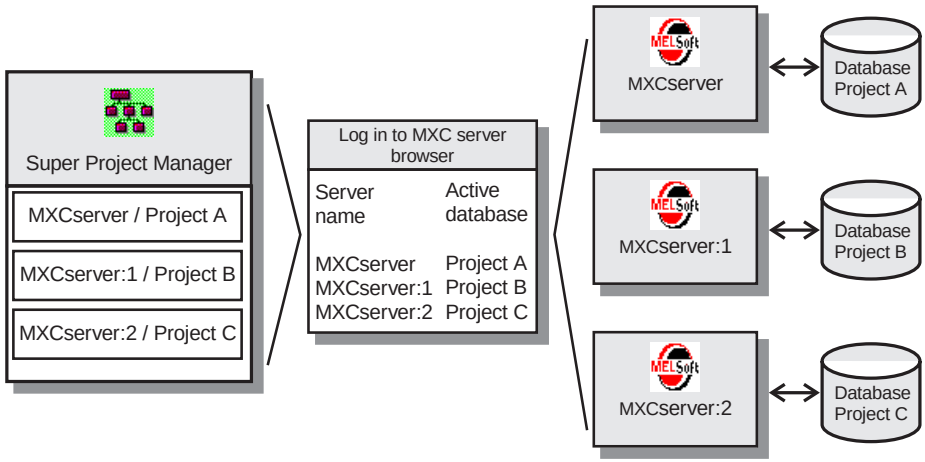
Three MXChange servers running on one single computer:



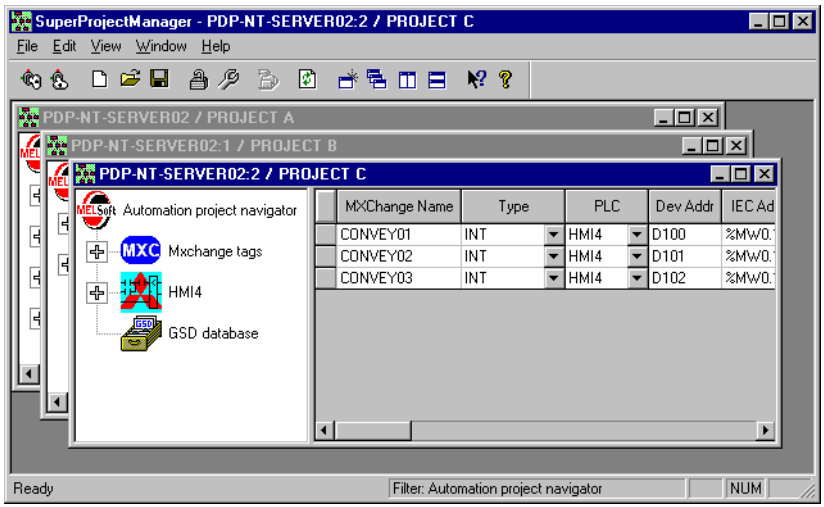
Click on **Stop** to suspend the service temporarily and restart it with **Start**.
Click on **Stop & Close** to exit the server.

5.3 Multiple automation projects handling

In order to handle more than one automation project within the Super Project Manager you have to start another MXChange server on the same personal computer. Each server handles its individual database. The additional server instances retain their name with an appended ":n" (where n is a successive number beginning with 1):



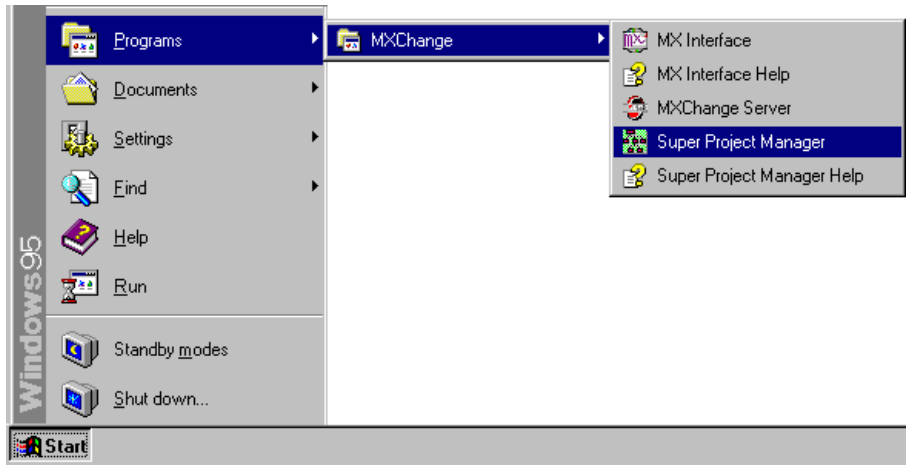
Within the Super Project Manager you can log in to more than one server instance and handle the corresponding projects in individual windows. For each activated server window you can create, open, close, and delete an individual project database:



SPM

5.4 Starting the Super Project Manager

Start the Super Project Manager from the MS Windows Start/Programs menu (or from where you installed it):

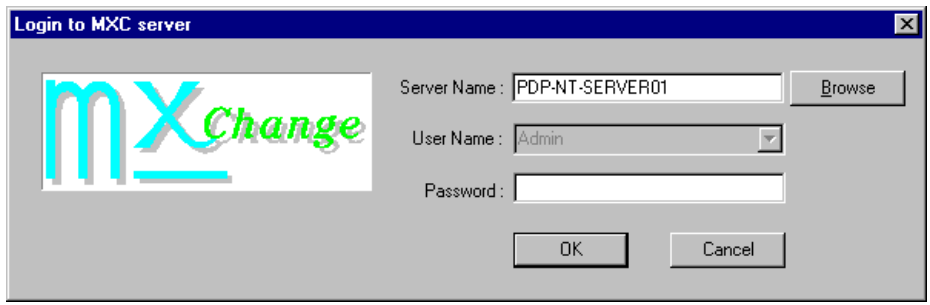


5.4.1 Logging in

When starting up or on selecting **Log in** from the **File** menu, a dialog box appears requesting the server name with which to connect, a user name, and password.

The **User Name** currently cannot be changed and is fixed to **Admin**.
The default **Password** is "" (leave it blank).

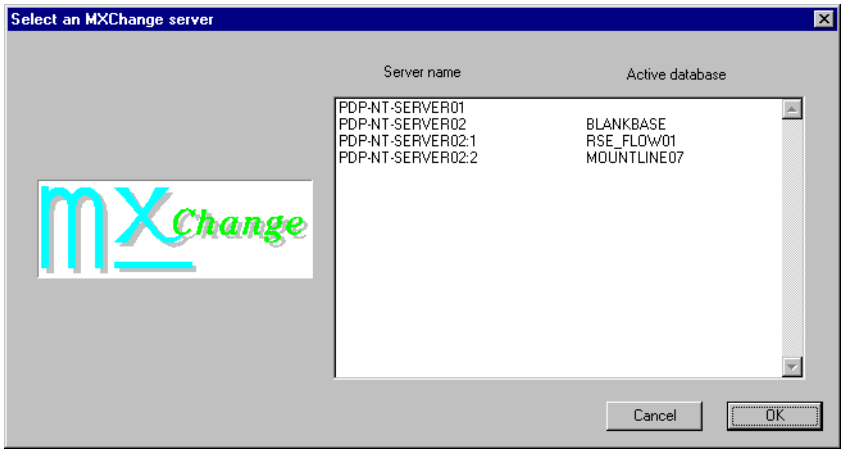
Note: *The server distinguishes upper-case and lower-case characters within the user name and password.*



Browse launches the server browser window. After OK is selected, the main project window will be opened with a connection to the given server.

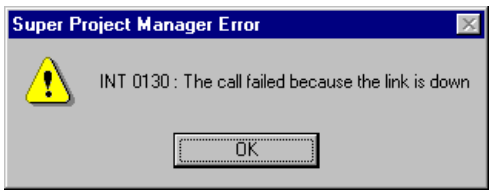
5.4.2 Server browser

The server browser lists all MXChange servers selectable across the current TCP/IP network or environment. Select one of these and click OK.



If there is more than one MXChange server running on one single personal computer, the additional MXChange servers are numbered successively (Server:1, Server:2, ...).

If there is no MXChange server available, the browser window remains blank. If you have already entered a server name, user name, and password in the login window, an error message appears:

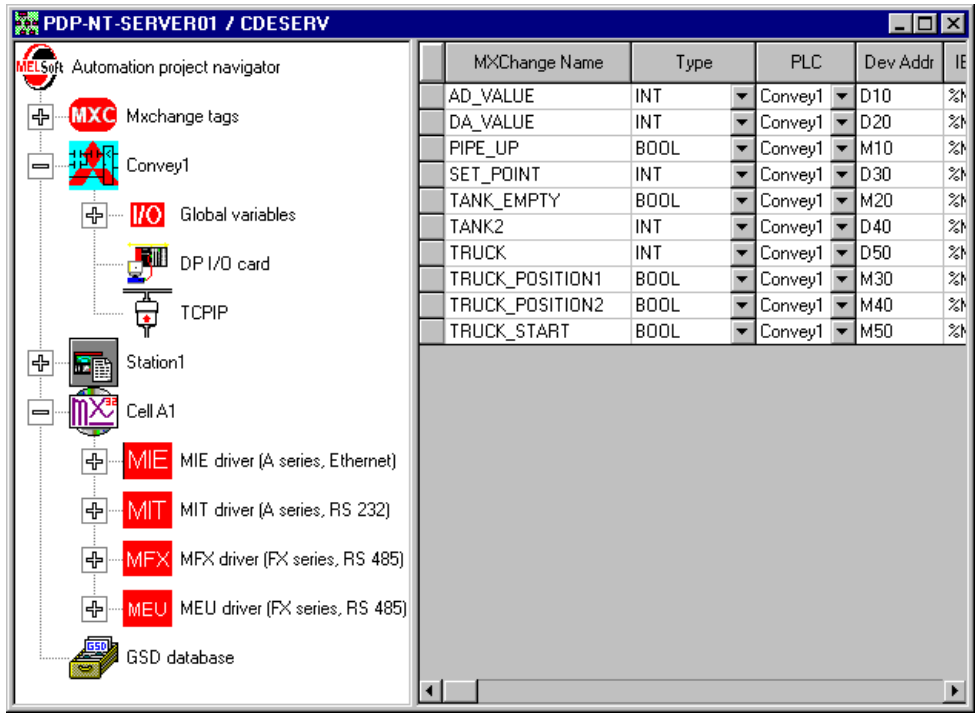


In this case start the MXChange server with the required database on your local personal computer or on a remote one accessible across the TCP/IP network.

5.5 Using the Super Project Manager

5.5.1 Main project window

When a connection to the server has been established, the main project window is displayed.



Automation project navigator window Tag Editor window

The title bar of the window displays "SERVER NAME / COMMON DATABASE NAME".

Click on ⊞ to expand and on ⊟ to collapse nodes in the Project Navigator window.

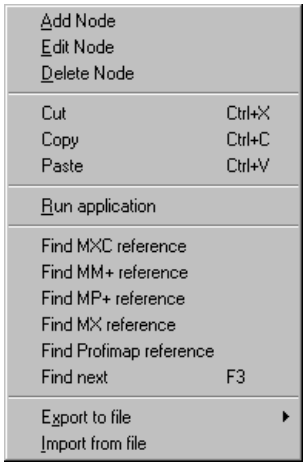
The Tag Editor window is part of the **MXChange Tag Editor**, which is integrated into the Super Project Manager. The Tag Editor window displays the MXChange tags and data.

5.5.2 Refreshing the project window

To update the tree in the main project window, select **Refresh** from the **View** menu or from the toolbar. The tree will also be updated if it is changed by **Add node**, **Delete node**, **Modify node**, **Cut**, or **Paste**.

5.5.3 The Project Navigator context menu

Right-click on any node in the Project Navigator window to open the context menu:



All menu functions apply to the currently selected node.

5.5.4 Searching the database

To search the database the following context menu functions are avaliable:

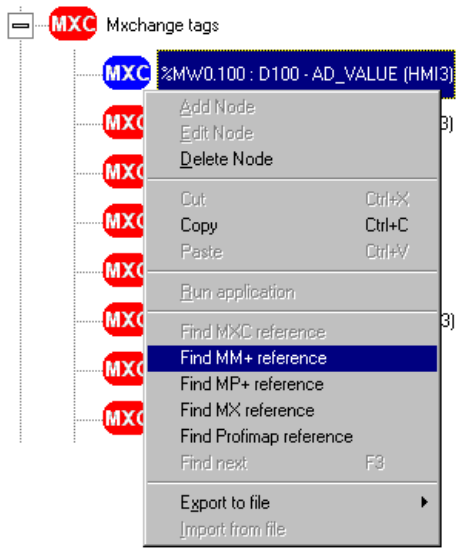
- Find MXC reference
- Find MM+ reference
- Find MP+ reference
- Find MX reference
- Find Profimap reference

The context menu functions allow you to search the database for an MXChange tag in the different projects and vice versa. The tag to find is the currently selected node. If it has been found, the reference will be highlighted in the Project Navigator. If more than one reference was found, the next reference can be highlighted by selecting **Find next**. When no more references exist, the **Find next** option will be disabled.

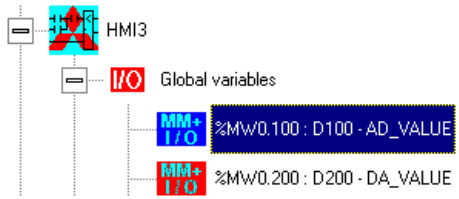
Example

You want to find out to which project(s) an MXChange tag belongs.

Right-click on the desired MXChange tag to open the context menu and select **Find ... reference**:



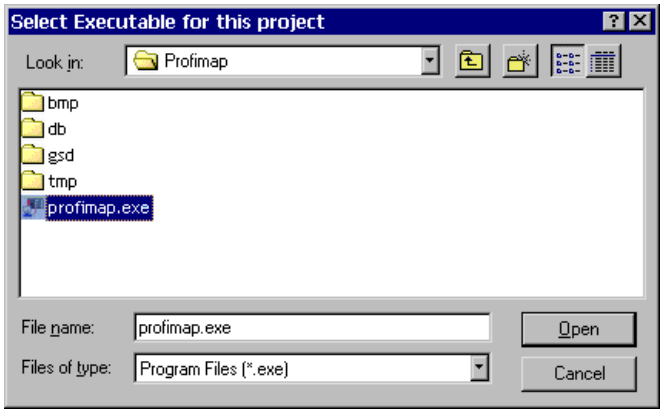
If the tag occurs in the selected project type, it will be highlighted:



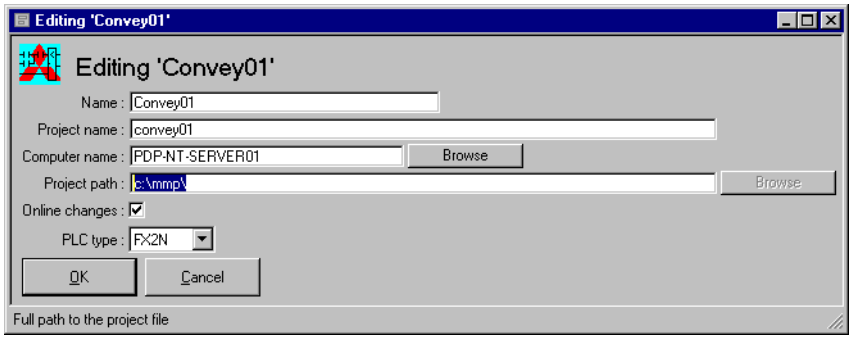
If the tag does not occur in any project of the selected type, the following message appears:

5.5.5 Run application

Each project in the Super Project Manager should have an associated configuration program. These may include MX SCADA, MELSEC MEDOC *plus* and ProfiMap. If you select this option, the correct configuration program will be launched. Initially, the path of the configuration program may be missing; if so, the following dialog box will appear in which you can select the correct program.



The file path and file name of the project and the name of the computer where the project is stored can be edited in the **Edit Node** dialog. Right-click on the project node you want to edit in the Project Navigator window and select **Edit Node**:

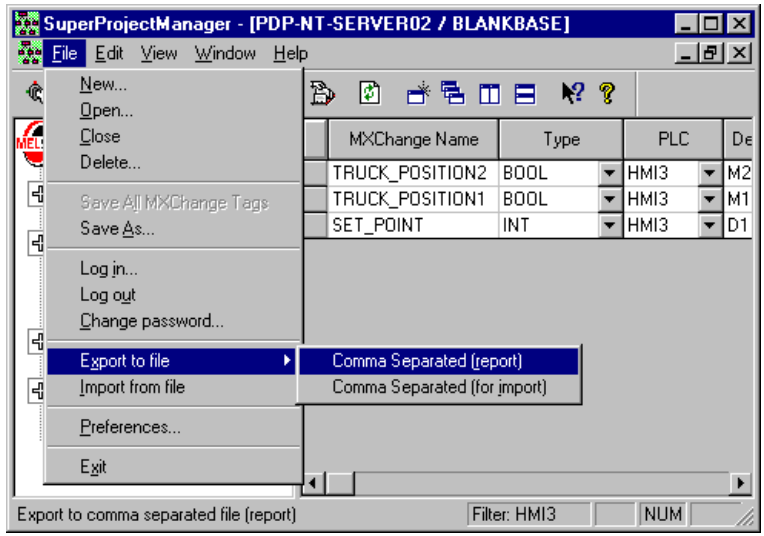


5.5.6 Export

Selecting **Export to file** provides two formatting options:

- **Comma Separated (report)** exports the entire project in a viewable format.
- **Comma Separated (for import)** exports only the tags for the PLC currently highlighted and their corresponding MXChange tags in a format allowing the tags to be imported into another project.
  Only Melsec Medoc *plus* projects can be exported in the importable format.

The file format is **Comma Separated Value** (*.csv). Therefore, it can be read by various application programs, for example by MS Excel.



You can specify the path and file name in a common Windows dialog.

Sample file: Export comma separated for import

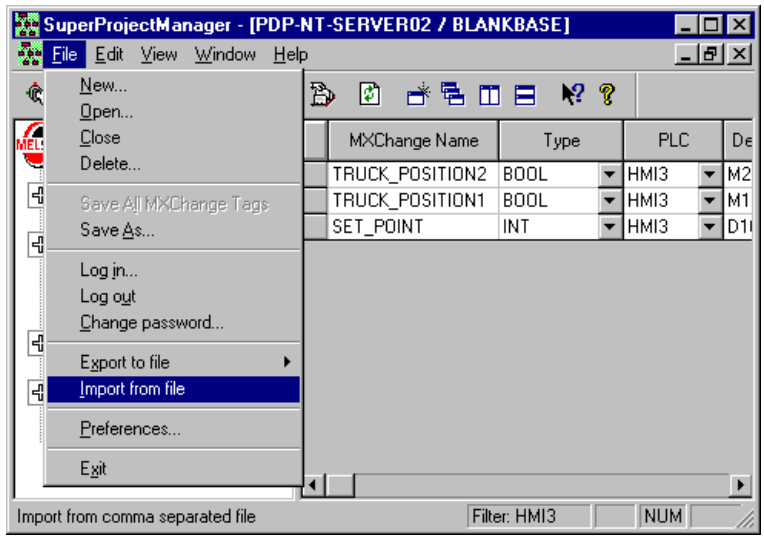
```
MXC_EXP_1.1
HMI3,MM+ Project (A)
SET_POINT,D2,INT,,0,2,1,SET_POINT,VAR_GLOBAL,0
TRUCK_POSITION1,M1,BOOL,,0,0,1,TRUCK_POSITION1,VAR_GLOBAL,0
TRUCK_POSITION2,M2,BOOL,,0,0,1,TRUCK_POSITION2,VAR_GLOBAL,0
```

Sample file: Export comma separated for report

```
MXChange Configuration

Server Name:,PDP-NT-SERVER02
Database name,BLANKBASE
Exported on,11/05/99 10:58:09,

MXChange Tags

Name,PLC,Type,Address (Mitsubishi),Address (IEC),IO
Bit,Size,Elements,Description

SET_POINT,HMI3,INT,D2,%MW0.2,,2,1,
TRUCK_POSITION1,HMI3,BOOL,M1,%MX0.1,,0,1,
TRUCK_POSITION2,HMI3,BOOL,M2,%MX0.2,,0,1,


MM+ Project,HMI3

 Cards,
  TCP/IP Card,TCP/IP10,Slot,1,IP Address,10.200.22.10,Port,1280,

 Name,Address (Mitsubishi),Address (IEC),Function
Block,Instance,Class,Remark
 SET_POINT,D2,%MW0.2,None,None,VAR_GLOBAL,Remark,
 TRUCK_POSITION1,M1,%MX0.1,None,None,VAR_GLOBAL,Remark,
 TRUCK_POSITION2,M2,%MX0.2,None,None,VAR_GLOBAL,Remark,


MAC Project,Station1

 Connection "MAC PLC connection" to PLC "HMI3"
  Name,Address (Mitsubishi),Address (IEC)
  SET_POINT,D2,%MW0.2
  TRUCK_POSITION1,M1,%MX0.1


MX32 Project,Cell A1

 Driver,MQE driver,
  Channel,Channel1,
   Device,M11,
    Name,Address (Mitsubishi),Address (IEC),Scan Time,Low EGU,High
EGU,Units,Open Label,Close Label
    SET_POINT,D2,%MW0.2,1,-32768.00,32767.00,,Open,Closed,
```

5.5.7 Import

Selecting **Import from file** from the **File** or context menu brings up a file/open dialog box to select an appropriately formatted comma separated file (*.csv). This file when selected will import the MXChange tags into the according Melsec Medoc *plus* project:



Only MXChange tags can be imported. A new Melsec Medoc *plus* project node can not be added via the import function. Therefore, a Melsec Medoc *plus* project node with an I/O connection (e.g. PLC local I/O) must already exist.

Import into selected automation project

If you select the top node **automation project navigator** and then execute the import function, the included Melsec Medoc *plus* projects will be checked for their name and their CPU type. Only if name and CPU type match, the MXChange tags will be imported into the corresponding Melsec Medoc *plus* project.

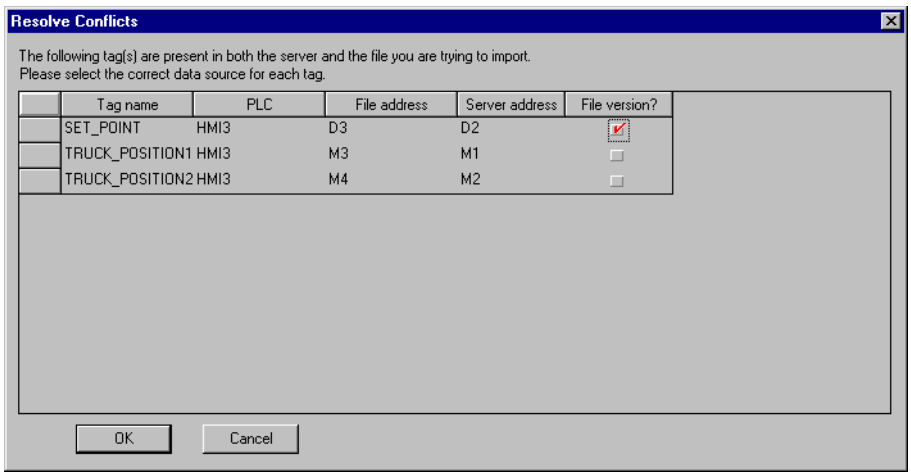
Import into selected Melsec Medoc *plus* project

If you select any Melsec Medoc *plus* project and then execute the import function, the MXChange tags will be imported into the selected project, regardless of its name or CPU type.

Resolve import data conflicts

Conflicts occurring between the import file data and the server database will be displayed in a dialog box. To resolve these conflicts you have to specify the master data source for each tag.

The default master source is the server database. Activate the **File version** checkbox to select the import file as source for the respective tag:



Note: ***All*** *data fields of the import data are checked, not only those displayed in the* ***Resolve Conflicts*** *dialog. Therefore the* ***Resolve Conflicts*** *dialog might come up although not displaying the explicit conflict. In this case check the import file for differences.*

Importable data format

The data format is *.csv (comma separated value) and can be imported and exported by most spreadsheet programs. The layout is very simple and starts with a short header, followed by a list of tags.

Header:

The first line indicates the export file version:

MXC_EXP_1.1

The second line indicates the project name and project type:

Project name,Class type

List of tags:

<tag>,<address>,<type>,<description>,<level>,<elemsize>,<elems>,[...]

The I/O bit column in the tag editor is not directly exported but included in the address in dot notation (e.g. D2.1).

[...] is the MM+ specific data as follows:

<name>,<class (default = VAR_GLOBAL)>,<level>

Only the following fields have to be specified:

<tag>,<address>,<type>,<description>

In this case for the remaining fields default values are used:

level = 0
elemsize = 0
elems = 1
name = tag name
class = VAR_GLOBAL
level = 0

Sample file: Importable data format

```
MXC_EXP_1.1
HMI3,MM+ Project (A)
SET_POINT,D2,INT,,0,2,1,SET_POINT,VAR_GLOBAL,0
TRUCK_POSITION1,D0.1,BOOL,,0,0,1,TRUCK_POSITION1,VAR_GLOBAL,0
TRUCK_POSITION2,M2,BOOL,,0,0,1,TRUCK_POSITION2,VAR_GLOBAL,0
```

Note: *MS Excel uses different separator characters for the CSV export depending on the installed language version. The English language version uses the "**,**" character as separator. The German version for example uses the "**;**" character as separator. MXChange checks the separator character and accepts both.*

5.5.8 Logging out

To shut down the connection to the server and to close the main project window for the connection, select **Log out** from the **File** menu.

5.5.9 Closing the application

To close all windows and to shut down the application, select **Exit** from the **File** menu.

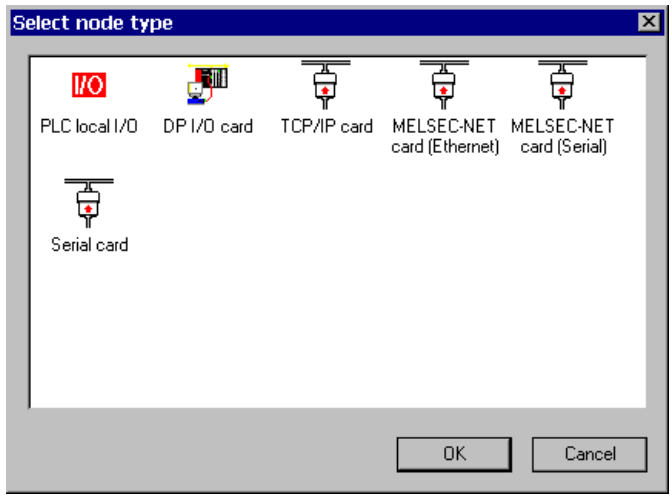
5.6 Nodes

The complete Super Project is represented as hierarchical nodes. Within this hierarchy each node itself can have a parent node above and a child node below. By this the relationship between the items within projects is clearly indicated. The top level node is the automation project manager covering all individual projects.

Note: *The term* **node** *in general refers to the connecting points that form a tree structure. MXChange represents an entire automation project as a hierarchical tree consisting of nodes. Any item displayed in the project tree is a node. Each single node represents an individual PLC program, HMI project, I/O communications point, device driver, etc.*

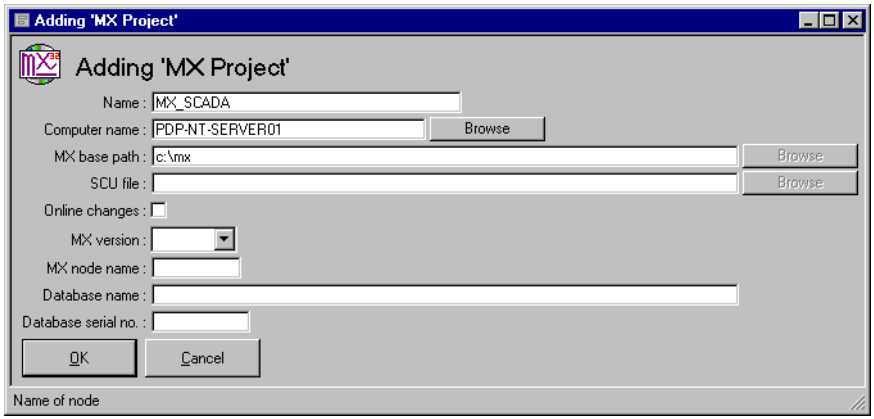
5.6.1 Adding a node

To add a node, select **Add node** from the **Edit** menu or from the Project Navigator context menu. A dialog box appears in which the node type can be selected. The node types which can be selected depend on the project type they are added to. Below the node types for a MELSEC MEDOC *plus* project are shown:



The new node will be added below the currently selected node. Only nodes of an appropriate type can be added. After the node type has been selected, an edit window will be opened in which the appropriate data can be entered.

Add Node dialog. The entries depend on the selected parent node. The example below shows how to add an MX project to the automation project navigator:

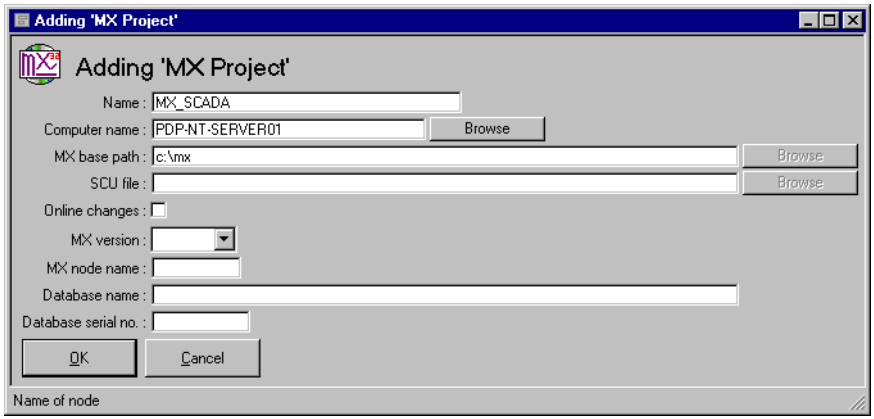


Note: *Each automation development tool is capable of inserting a project node so that all this information will be generated automatically.*

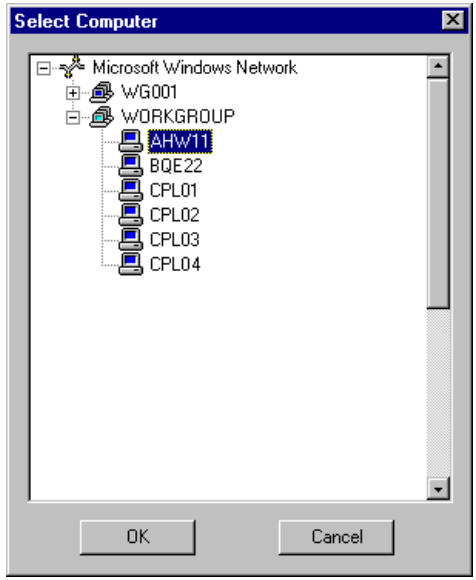
5.6.2 Node dialog browsers

There are browse buttons available for some types of entry fields in the node dialogs. If the field requires a computer name, directory folder or file name, then a browse buttons are available. The following dialogs appear accordingly.

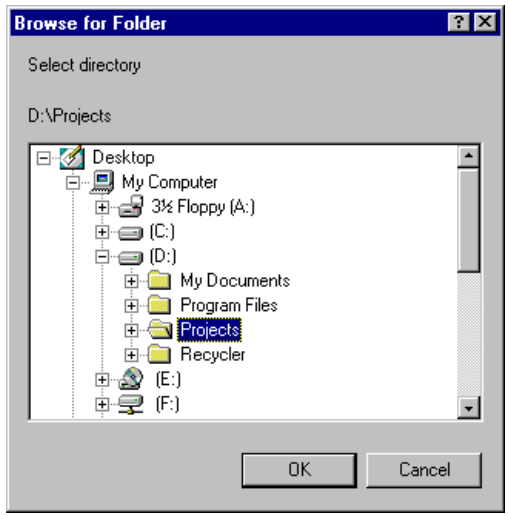
Example Add node dialog:



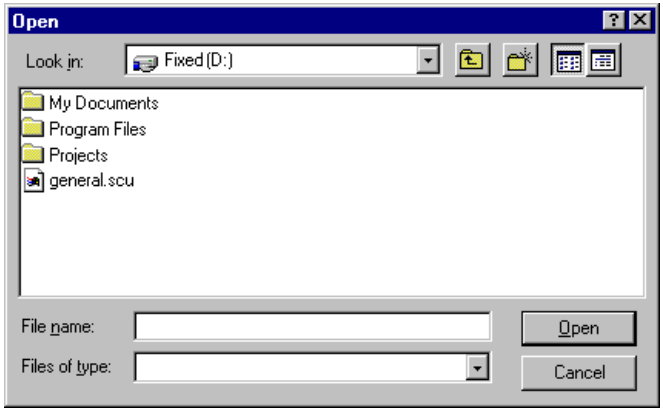
Browse for computer



Browse for folder



Browse for file

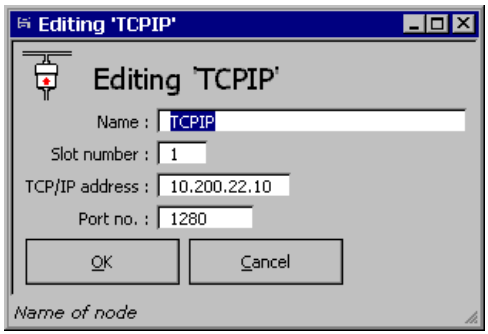


Select the relevant item, and click OK, and the selection will be inserted into the field.

5.6.3 Editing a node

To modify the currently selected node, select **Edit Node** from the Edit menu or from the Project Navigator context menu. Then an appropriate dialog box appears which is identical to that for adding a node.

Edit Node dialog. The entries depend on the selected node. The example below shows how to edit a TCP/IP card of a MELSEC MEDOC *plus* project:



5.6.4 Deleting a node

To delete the currently selected node, select **Delete Node** from the **Edit** menu or from the Project Navigator context menu.

WARNING: *Deleting a node cannot be undone.*

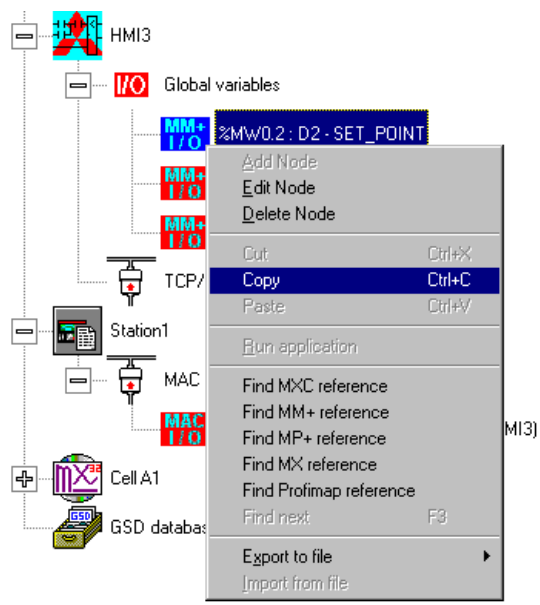
5.6.5 Cut, copy, and paste

When **Cut** or **Copy** is selected, the currently selected node including all child nodes is copied. In case of **Cut**, the node is then deleted. Selecting **Paste** will paste the previously copied node as a child of the currently selected node. The **Paste** option will be enabled only when the copied node can be a child of the selected node.

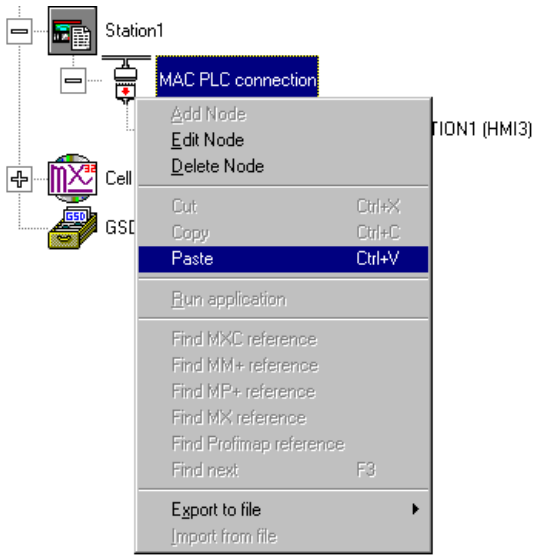
You can only select one tag each for the cut, copy, and paste function.

Example:

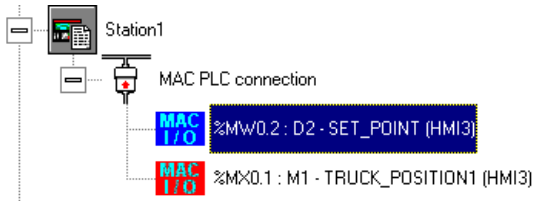
Right-click on the node you want to copy (MELSEC MEDOC *plus* variable, D100 AD_VALUE) to open the context menu and select copy:



Right-click on the parent node (MAC PLC connection) in which you want to paste the copied node. The context menu is opened. Select paste:



The node (variable D100 AD_VALUE) is added:



5.6.6 Drag and drop

Drag and drop is a simplified way of cutting, copying, and pasting.

To move a node:

① Select the node to be moved and hold down the left mouse button.

② Drag the node to the desired location.

③ Release the mouse button. The node is now dropped in the new location.

To copy a node:

① Select the node to be copied and hold down the left mouse button.

② Drag the node to the desired location.

③ Hold the **CTRL** key and release the mouse button. The node is now dropped in the new location.

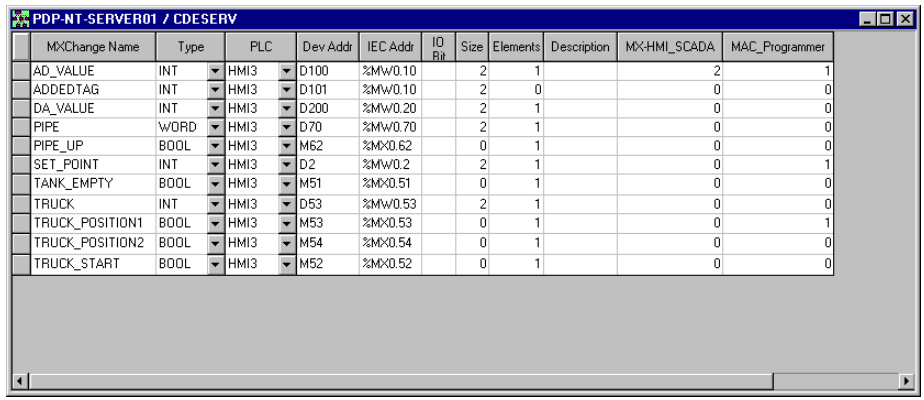
5.7 Integrated Tag Editor

The Tag Editor is a table of all tags included in the MXChange database. The tags can be added, edited, or deleted via the Tag Editor. Additionally, the tags can be added to other projects or deleted from them.

A tag can be added with several attributes set automatically and with values increasing or decreasing by different amounts each time it is added.

5.7.1 Main Tag Editor window

The main Tag Editor window lists all tags included in the MXChange database. Each row contains one tag and the respective MXChange data. Additionally, the row includes a list of projects to which the tags belong.



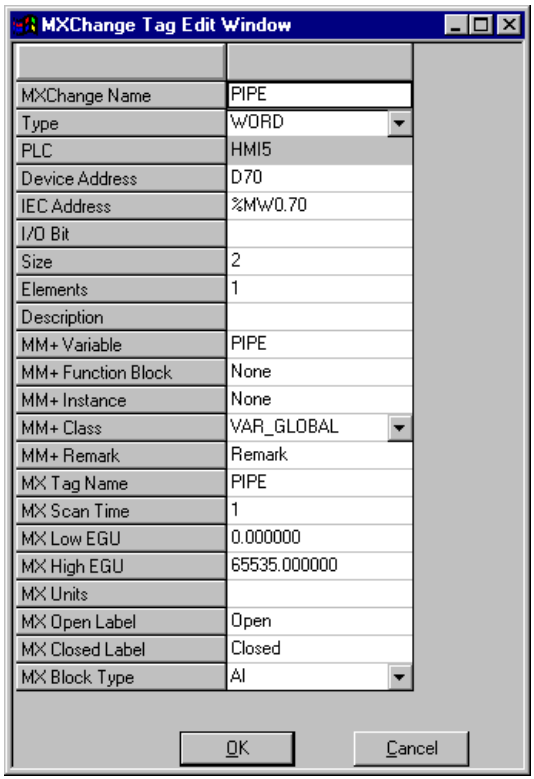
MXChange Name	Type	PLC	Dev Addr	IEC Addr	IO Bit	Size	Elements	Description	MX-HMI_SCADA	MAC_Programmer
AD_VALUE	INT	HMI3	D100	%MW0.10		2	1		2	1
ADDEDTAG	INT	HMI3	D101	%MW0.10		2	0		0	0
DA_VALUE	INT	HMI3	D200	%MW0.20		2	1		0	0
PIPE	WORD	HMI3	D70	%MW0.70		2	1		0	0
PIPE_UP	BOOL	HMI3	M62	%MX0.62		0	1		0	0
SET_POINT	INT	HMI3	D2	%MW0.2		2	1		0	1
TANK_EMPTY	BOOL	HMI3	M51	%MX0.51		0	1		0	0
TRUCK	INT	HMI3	D53	%MW0.53		2	1		0	0
TRUCK_POSITION1	BOOL	HMI3	M53	%MX0.53		0	1		0	1
TRUCK_POSITION2	BOOL	HMI3	M54	%MX0.54		0	1		0	0
TRUCK_START	BOOL	HMI3	M52	%MX0.52		0	1		0	0

5.7.2 Node specific data dialog

To access the node specific data dialog

- double-click on a tag entry
  or
- right-click on the Tag Editor window.

The node specific data dialog contains the information for specific projects that contain the selected MXChange tag.



If the tag is included in multiple projects of the same type, the list may contain several columns. In this case the first 10 fields are the common MXChange fields as in the main Tag Editor window. The next 5 fields are MELSEC MEDOC *plus* specific fields, the next 6 are for ProfiMap, and the last 8 are for MX SCADA.

5.7.3 MXChange tags

The MXChange tags contain the following fields:

MXChange name

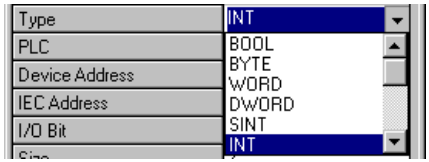
A valid MXChange name must start with a letter and may include further letters, numbers, underscore characters (_), mathematical signs, like "+, -, *", and the space character. The MXChange name is used to identify the tag and should describe the use of the tag in the project(s).

Note: *Several programming and configuration systems allow further characters (e.g. national characters like â, ä, à, å) in the name. If you use such characters, make sure that* **all** *projects dealing with the MXChange tag name can handle these characters.*

	Characters	Examples
Characters allowed for all configuration packages	"A...Z", "0...9", "_"	ALARM, LIM_SW_5

Note: *MX SCADA projects use only upper-case characters.*

Data type



The data type of a tag defines the type of data collected for this tag. The following table gives an overview of the mapping between types in each package.

Available data types

MXChange	MM+	MX block	MP+	ProfiMap	Range
BOOL	BOOL	DI/DO/DR	BOOL	BOOL	0 (FALSE), 1(TRUE)
BYTE	-	-	-	INT8 ①	0 to 255
WORD	WORD	AI/AO/AR	WORD	UINT16 ①	0 to 65535
DWORD	DWORD	AI/AO/AR	DWORD	UINT32 ①	0 to 4294967295
SINT	-	-	-	INT8	-128 to 127
INT	INT	AI/AO/AR	INT	INT16	-32768 to 32767
DINT	DINT	AI/AO/AR	DINT	INT32	-2147483648 to 2147483647
USINT	-	-	-	UINT8	0 to 255
UINT	WORD INT ①	AI/AO/AR	INT ①	UINT16	0 to 65535
UDINT	DWORD DINT ①	AI/AO/AR	DINT ①	UINT32	0 to 4294967295
REAL	REAL	AI/AO/AR	REAL	FLOAT	IEC 559
STRING	STRING ②	TX ①	ASCII[ ]	VISIBLE_STR	● ③
TIME	TIME	-	-	-	● ③
DATE	-	-	-	DATE	● ③
TIME_OF _DAY/TOD	-	-	-	TIME OF DAY	● ③
Array ④	ARRAY[ ]	-	-	-	

① *Types do not match exactly but are the closest match*

② *QnA only (default value 20 characters, maximum value 255 characters)*

③ *Depends on implementation*

④ *The number of elements is specified in the Tag Editor by grouping individual tags into an ARRAY.*

PLC

The name of a PLC available to MXChange (read only).

Device Address

The address of the item that the tag points to.
Example: D450

IEC Address

The address of the item that the tag points to in IEC format.
Example: %MW0.450

I/O Bit

In case of BOOL tags each bit of a longer data type can be assigned by the I/O bit. The value (n) of the I/O Bit is the nth bit in the longer data type.

The value can be

- in the range of 0 to 15
- or -1 to indicate no offset.

Size

The size of the data in bytes which the tag collects. The Tag Editor automatically changes the size when the data type changes.

Elements

The number of elements of a specific data type at a specific address. For example, if the number of elements is four, then there would be four elements of a specific data type at this address. The elements represent an **ARRAY**.

Description

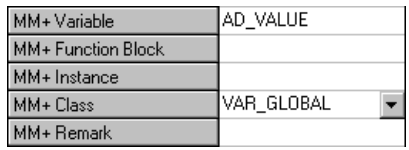
A comment to describe the purpose of the tag.

5.7.4 Node specific tag descriptions

In addition to the common MXChange tag data, tags may have supplementary details in the **Tag Edit Window** pertaining to the different projects types:

MM+

Item	Description
MM+ Variable	The tag name in the MM+ project
MM+ Function Block	The function block identifier
MM+ Instance	The function block instance identifier
MM+ Class	The tag class
MM+ Remark	Supplementary comment



Available classes for MM+

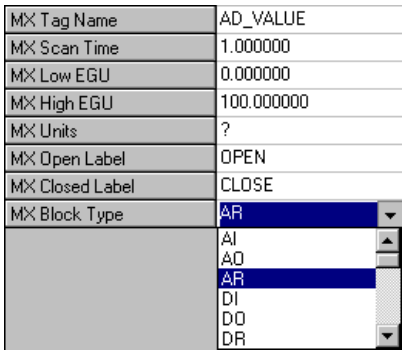
Currently only VAR_GLOBAL is supported.

ProfiMap

Item	Description
ProfiMap FMS Index	The FMS index of the tag
ProfiMap FMS Name	The tag name in FMS
ProfiMap Device	The device this tag references
ProfiMap Parent	The parent tag on the device
ProfiMap Type	Tag type (DP or FMS)
ProfiMap In/Out	Input or output tag

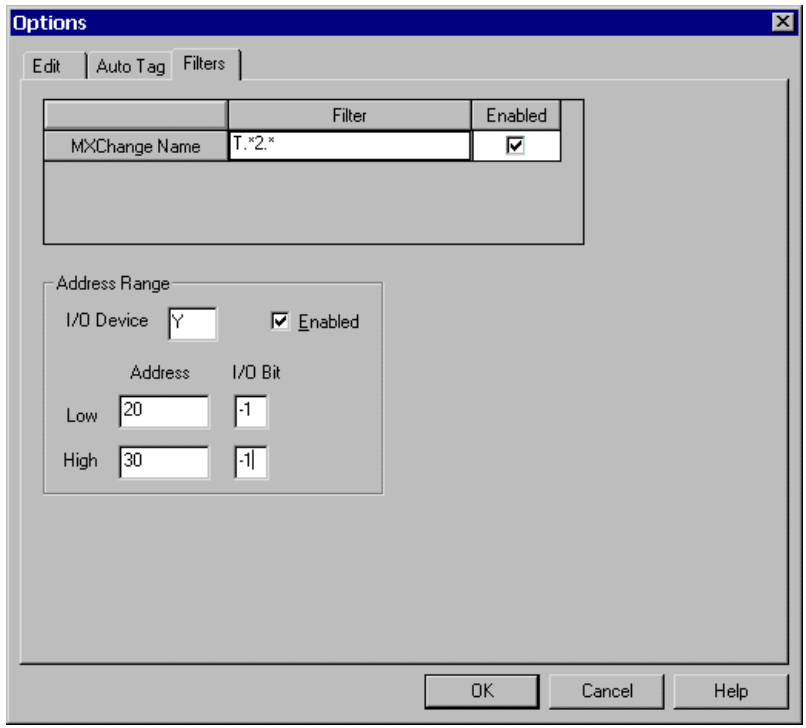
MX SCADA

Item	Description
MX Tag Name	The tag name in the MX project
MX Scan Time	The scan time for the tag
MX Low EGU	The lower limit of the tag's value in MX
MX High EGU	The upper limit of the tag's value in MX
MX Units	The units, e.g [m/s] for analog tags
MX Open Label	The open (0) label for digital tags
MX Closed Label	The closed (1) label for digital tags
MX Block Type	The block type in MX (**A**nalog **I**nput, **A**nalog **O**utput, ...)



5.7.5 Filtering the Tag Editor display

To keep track of numerous MXChange tags, you can filter specific tags to be displayed in the Tag Editor. To access the context menu, right-click on the Tag Editor and select **Options**:



There are two ways to filter the tags displayed in the Tag Editor window:

- When you enter a **regular expression** for the required MXChange names, all tags matching this expression will be displayed. All other tags are hidden.
- When you enter a device range, only the tags of the specified range are displayed.

Regular expressions for filtering

Regular expressions are text patterns that are used for string matching in order to filter the displayed information. Regular expressions are strings containing text and special characters to indicate the matching type.

The simplest regular expression is the first part of the string to match. "TRACK" e.g., would match all MXChange names beginning with "TRACK".

To find a digit, the regular expression to search for is "[0-9]". The brackets indicate that the digits being compared match any of the digits enclosed in the brackets.

The dash (-) between 0 and 9 indicates that it is a range from 0 to 9. Therefore, this regular expression will match any character between 0 and 9, that is, any digit. If you want to search for a special character, use a backslash in front of the special character. For example, the single character regular expression "*" matches a single asterisk.

In the table below the special characters which can be used in strings are briefly described.

Character	Description
^	Beginning of the string. The expression "^A" will match 'A' only at the beginning of the string.
^	The caret (^) immediately following the left-bracket ([) is used to exclude the remaining characters within brackets from matching the target string. The expression "[^0-9]" indicates that the target character should not be a digit.
$	The dollar sign ($) will match the end of the string. The expression "abc$" will match the sub-string "abc" only if it is at the end of the string.
|	The alternation character (|) allows either expression on its side to match the target string. The expression "a|b" will match 'a' as well as 'b'.
.	The dot (.) will match any character.
*****	The asterix (*) indicates that the character to the left of the asterix in the expression should match 0 or more times.
+	The plus (+) is similar to asterix but there should be at least one match of the character to the left of the + sign in the expression.
?	The question mark (?) matches the character to its left 0 or 1 times.
( )	The parenthesis affects the order of pattern evaluation and also serves as a tagged expression that can be used when replacing the matched sub-string with another expression.
[ ]	Brackets ([and]) enclosing a set of characters indicate that any of the enclosed characters may match the target character.

Examples:

TRACK	Matches all tag names beginning with "TRACK"
.*POS	Matches all tag names containing "POS" anywhere
.*A.*2.*	Matches all tags containing "A" followed by "2"
TAG_1[0-2][0-9]	Matches TAG_100 to TAG_129 inclusive
[P|D]	Matches tags starting with "P" or "D"

Example:

① Right-click on the Tag Editor to access the context menu.

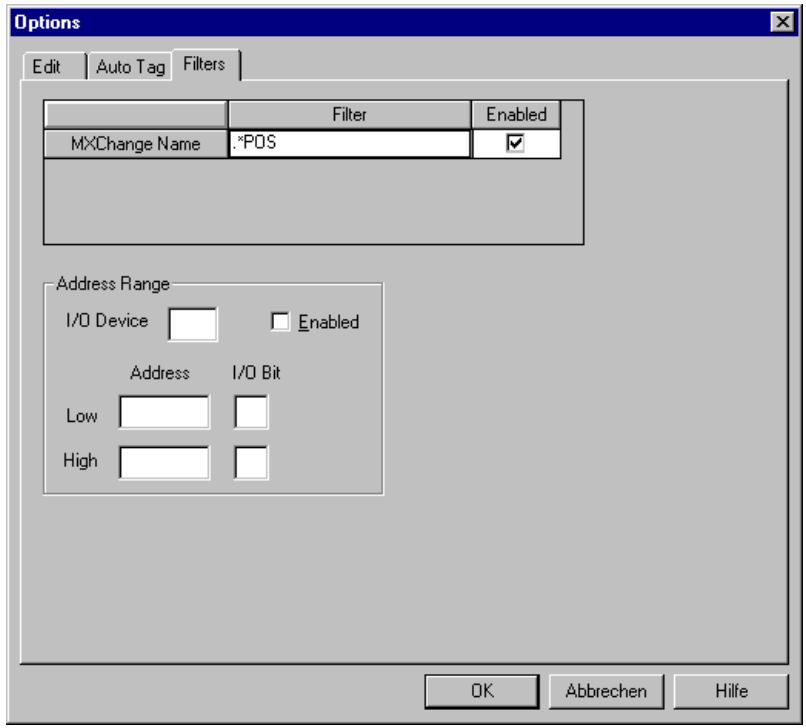
② Select **Options.**

③ Open the **Filters** dialog.

④ Enter the desired expression, e.g. ".*POS" for any tag name containing the string "POS".

⑤ Check the **Enabled** box.

⑥ Click on OK .

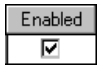


⑦ The Tag Editor now lists only matching entries:

	MXChange Name	Type	PLC	Dev Addr
	TRUCK_POSITION1	BOOL	HMI3	M53
	TRUCK_POSITION2	BOOL	HMI3	M54

⑧ To deactivate any filter, uncheck the **Enabled** box in the **Options/Filters** dialog.

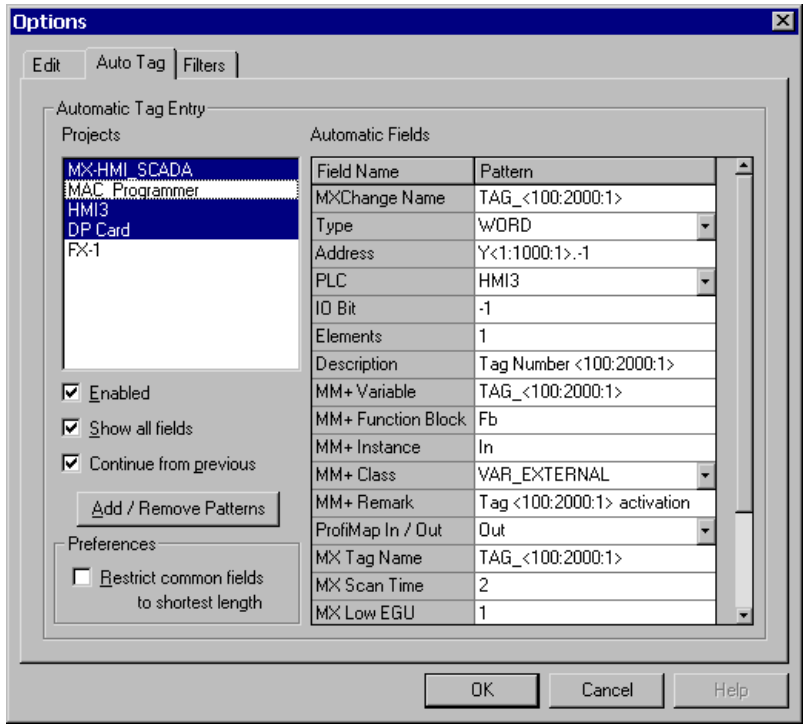
Note: *The filter distinguishes upper-case and lower-case characters within the expressions to be matched.*



Do not forget to check the **Enabled** *box in the* **Filter** *dialog.*

5.7.6 Automatic tag entry

When adding a series of similar MXChange tags, a number of patterns can be filled automatically. To set up automatic tag entry, click on the **Options** button. Now, the automatic tag entry dialog box opens. The automatic tag entry dialog box gives a list of the available projects and the relevant fields. From these projects you can select the tag entries.



The list of available projects is on the left. The patterns valid for the selected projects is on the right.

The **Enabled** checkbox specifies whether automatic tag entry is enabled for the next tag(s) to be entered.

When the checkbox **Show all fields** is enabled, all patterns valid for the selected project are displayed. When this checkbox is not enabled, click the **Add / Remove Patterns** button to use the **Select Patterns** dialog.

When the checkbox **Continue from previous** is enabled, the counter is continued from the last tag which has been added. If 30 tags have been added and one field needs to be changed, the counter will restart from 31.

The **Restrict common fields to shortest length** checkbox ensures that different project types contain the same data by truncating the data to the maximum length of the shortest field.

There are two types of automatic data: static and dynamic.

Static data remains the same for every tag created with the automatic tag entry enabled. This is useful for setting the PLC.

Dynamic data changes for each new tag based on the patterns entered.

The patterns have the following form:

<Start:Finish:Step>

Start is the first numeric value to be replaced.
Finish is the last numeric value to be replaced.
Step is the number to be added to or subtracted from the previously added tag.

Example:

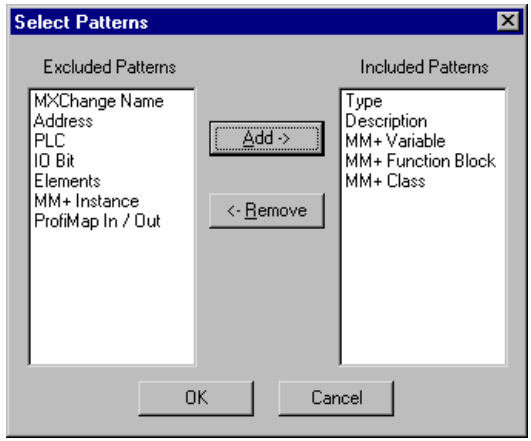
The pattern "New_Tag_<1:20:1>_A" was entered into the MXChange name field, when adding a new tag.

"New_Tag_1_A"

appears in the **MXChange Name** field in the main Tag Editor window. The next tags are "New_Tag_2_A", "New_Tag_3_A" etc. The last tag is "New_Tag_20_A".

5.7.7 Selecting patterns for automatic tag entry

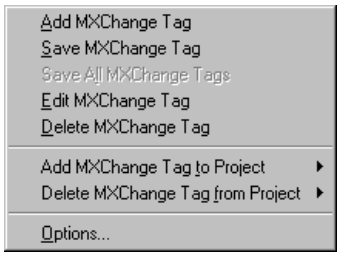
The **Select Patterns** dialog is used to select which patterns are to be displayed in the automatic tag entry dialog.



The list on the right shows the list of patterns currently included in the **Automatic Tag Entry**. To add patterns, select the patterns in the left list containing the excluded patterns and click **Add**. To remove patterns, select the patterns in the right list and click **Remove**.

5.7.8 Tag Editor context menu

To access the Tag Editor context menu, right-click on the Tag Editor window.



5.7.9 Tag operations

The Tag Editor supports the following tag operations.

Add a new tag

To add a new tag to the database, right-click on the Tag Editor window and select **Add MXChange Tag**.

This will insert a blank line (depending on the automatic tag entry settings), in which the details of the new tag can be typed. For more information on the tag data, refer to the section MXChange tags on page 5-28.

Save tag(s)

Depending on the user preferences, there are different ways to save tags:

- Save modifications automatically
  The modified node is saved when the cursor is moved off the current row.
- Save MXChange tag
  To save an MXChange tag, select **Save MXChange Tag** from the context menu.
- Save all MXChange tags
  To save all modified MXChange tags, select **Save all MXChange Tags** from the **File** menu or the context menu.
- Save selected tags
  To save selected tags, select a range of tags and select **Save MXChange Tag** from the context menu.

Edit an existing tag

To edit an existing tag, type the corrections into the Tag Editor window.

Edit node specific details

To edit the node specific details of a tag,

- double-click on the tag,
- or right-click on the tag and select **Edit MXChange Tag**,
- or press Ctrl E.

Then the node specific data dialog box appears. Enter the changes into the dialog box and click OK to save the changes.

Delete an existing tag

To delete an existing tag

- right-click on the tag and select **Delete MXChange Tag**
- or press Ctrl D.

After confirmation, the tag will be deleted.

Add a tag to a project

There are several ways to add a tag to a project:

- Click the right mouse button on the tag and select **Add MXChange tag to project**. A sub-menu will appear including a list of the projects available for this tag.
- Double-click the left mouse button on the corresponding tag and project field. The tag and project field is where the row containing the tag and the column containing the project intersect. If this field contains the value 0, then the tag will be added.
- Type the value 1 into the corresponding tag and project field.

To add multiple tags to a project, select a range of tags and right-click on the Tag Editor window. Select the project from the **Add MXChange tags to project** sub-menu. The tags will be added with default values for the project specific data.

Delete a tag from a project

There are several ways to delete a tag from a project:

- Click the right mouse button on the tag and select **Delete MXChange Tag from Project**. A sub-menu will appear including a list of the projects containing this tag.
- Double-click the left mouse button on the corresponding tag and project field. The tag and project field is where the row containing the tag and the column containing the project intersect. If this field contains the value 1 or higher, then the tag will be deleted.
- Type the value 0 into the corresponding tag and project field.

5.7.10 Multiple tag selection

MXChange Name	Type	PLC	Dev Addr	IEC Addr
AD_VALUE	INT	Convey01	D100	%MW0.10
DA_VALUE	INT	Convey01	D200	%MW0.20
PIPE	WORD	Convey01	D70	%MW0.70
PIPE_UP	BOOL	Convey01	M62	%MX0.62
SET_POINT	INT	Convey01	D2	%MW0.2
TANK_EMPTY	BOOL	Convey01	M51	%MX0.51
TANK2	INT	Convey01	D60	%MW0.60
TRUCK	INT	Convey01	D53	%MW0.53

Select more than one row in the Tag Editor window

There are several ways to select more than one row in the Tag Editor window:

- Click in the leftmost column (the one without heading) and drag the mouse up or down. The selected tags change to an inverted image.
- Alternatively, click in the left column of the first tag, hold the Shift key down, and click in the left column of the second tag.
- To select more than one block, hold down the Ctrl key and click on the rows to be selected.

To deselect the tags, click anywhere in the Tag Editor window but not in the leftmost column.

For the following operations it is possible to select multiple tags by clicking on the context sensitive menu of the Tag Editor window.

- Save
- Delete
- Add to project
- Delete from project

5.7.11 Sorting tags

To sort the tags by a specific column, click on the heading of the respective column.

MXChange Name	Type	PLC	Dev Addr	IEC Addr	IO Bit	Size	Elements	Description

5.8 Server database operations

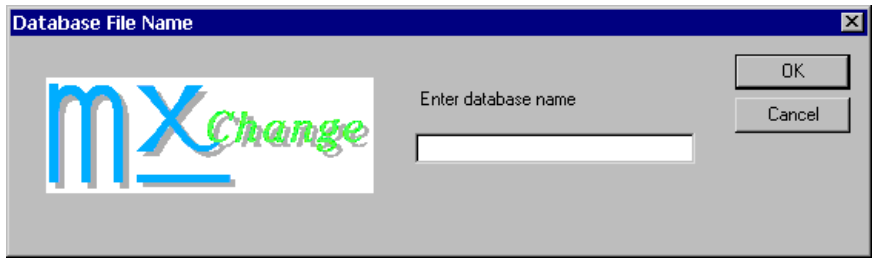
The MXChange server is capable of managing several databases. These databases must be located on the same personal computer as the server itself in the directory:

C:\Program Files\MelSoft\MXChange\Database

The following items are included in the **File** menu:

5.8.1 New

This option prompts for a file name.



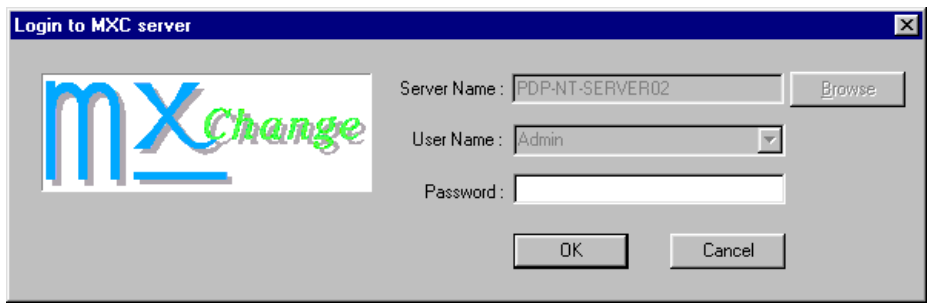
If the file name does not already exist, the server creates a new database with this name. The current database on the server is closed. The new database is loaded and displayed in the main window.

Password protection

Each database is protected by an individual password.

The password of the database that was opened when you selected the **File/New** command will be inherited to the new database.

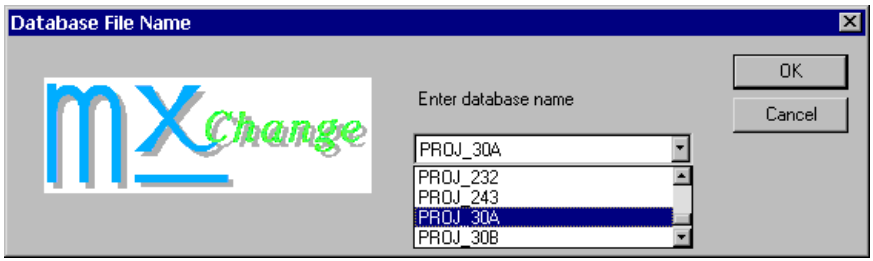
If there was no database opened when you selected the **File/New** command, the new database will be given the default password. The default password is "" (leave it blank). In this case you will be prompted for the password before the new database is displayed. Leave the password entry blank and confirm with OK.



Note: *The server and user name cannot be entered because here only the password for the new database to be displayed is requested.*

5.8.2 Open

This option provides a list of available databases.



Select a database and click OK. The contents of the current window(s) will be replaced by the opened database's nodes.

Where necessary, you will be prompted for the password of the database to be opened.

5.8.3 Save As

This option prompts for a database name.

If the database name does not exist, a new database will be created including the contents of the existing database. This new database will be loaded.

5.8.4 Close

This option closes the current database.

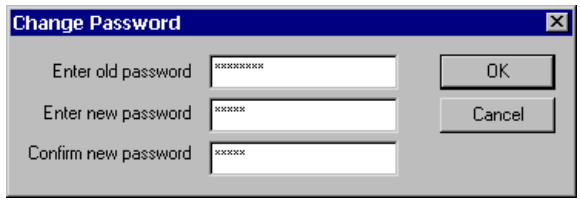
5.8.5 Delete

This option closes and deletes the current database.

5.9 Changing user preferences

5.9.1 Changing the user password

Each common database is protected by an individual password. To change the password, select **Change Password** from the **File** menu. The following dialog box appears:



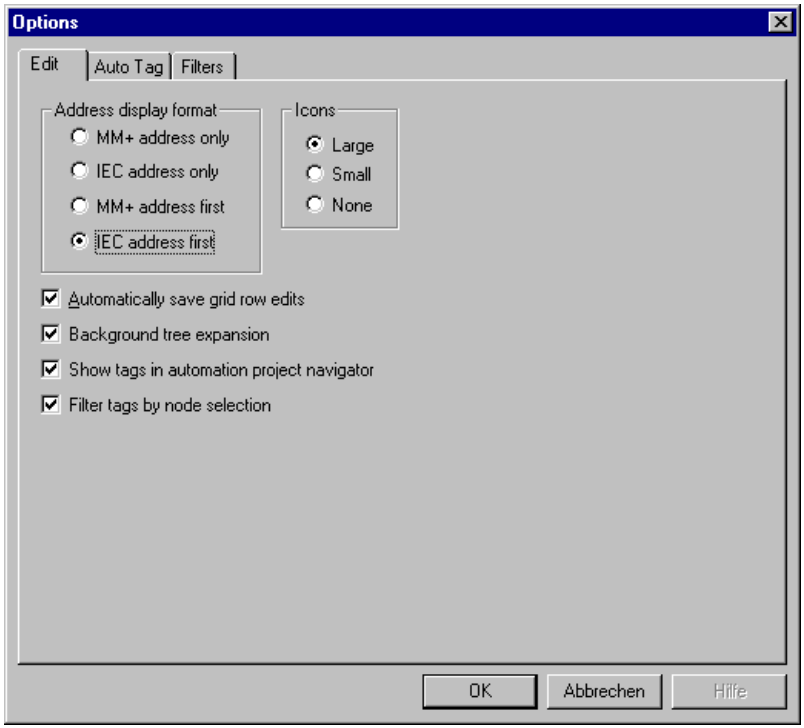
The default password is "" (leave it blank).

Enter all required information.

Click OK , the server changes the password. If the old password is incorrect, the password will remain unchanged.

5.9.2 Changing display preferences

To change display preferences, select **Preferences...** from the **File** menu. A dialog box with three tabs appears. The **Edit** tab presents the following options:



Address display format

The **Address display format** displays the tag location within the PLC. The location can be displayed in MM+ format, IEC format, or in both formats.
Default: IEC address at first

Icons

Icons in the main project window can be large (32x32), small (16x16), or they are omitted completely.
Default: Large

Automatically save grid row edits

When editing tags in the Tag Editor window, the current tag can be saved as soon as you leave the current row. To enable this, check the respective box. If the box is not checked, the new or modified tags must be saved explicitly.
Default: Enabled

SPM

Background tree expansion

If background tree expansion is enabled, the Super Project Manager will wait for a gap between instructions and then fetch details of the tags from the server. This reduces time necessary to expand tags in the main project windows, as the details have already been found. Preferences will be changed only in the current window, but the new values will be stored and used as the initial values for any subsequent connections.
Default: Enabled

Show tags in automation project navigator

To reduce the size of the automation project navigator, the tags can be hidden. The tags will still be visible in the Tag Editor window. To hide the tags in the automation project navigator, disable this option.
Default: Enabled

Filter tags by node selection

To reduce the size of the Tag Editor window, the tags can be filtered according to the project selected in the hierarchy pane. When selecting a project in the hierarchy pane, the tags not contained in that project will be removed from the Tag Editor window. Previously hidden tags which are contained in that project will be restored to the Tag Editor window view. If a node which is not a project is selected in the automation project navigator, the project to which the node belongs will be chosen. If the tag is not contained in a project, all tags will be displayed. The project used for filtering will be displayed in the status bar.
Default: Enabled

5.9.3 View

When selecting **Toolbar** or **Status Bar** from the **View** menu the relevant control will be toggled between hidden or displayed. The current status is indicated by a check mark beside the menu item.

5.9.4 Arranging windows

Cascade

When selecting **Cascade** all the open windows in the application (project windows and edit or add node windows) will be arranged one behind the other. The title bars are staggered.

Tile

When selecting **Tile**, all open windows will be arranged and resized so that they are all visible. They will be arranged one above the other (tile vertical) or side by side (tile horizontal).

5.10 Help

5.10.1 Getting help

Selecting **Contents** from the **Help** menu will bring up a browser including online help.

5.10.2 Getting context sensitive help

To get the context sensitive help, press F1 or select an item via the context sensitive help cursor. This will bring up a browser including online help. The browser will display the relevant topic for the item. If no specific help exists for the item, the first online help topic will be displayed.

5.10.3 About Super Project Manager

To get information on the current version of the Super Project Manager, select **About**.

6 External Tag Editor (16-bit)

The external 16-bit version of the Tag Editor is intended for personal computers running MS Windows 3.11.

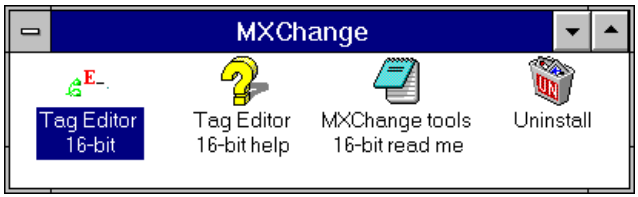
The functions and procedures are the same as described for the integrated version within the Super Project Manager. For detailed instructions refer to the section "Integrated Tag Editor" on page 5-26.

6.1 Running the external Tag Editor

1. Start the Tag Editor

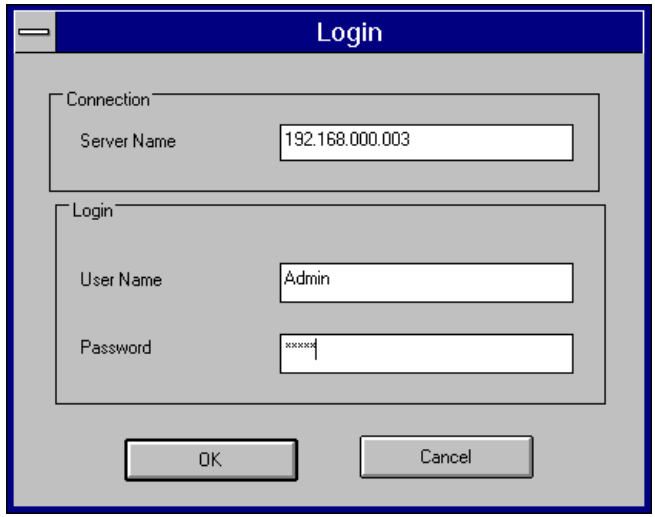
- Double-click on the **MXChange** program group in the Windows Program Manager.
  The program group opens.

- Double-click on the **Tag Editor 16-bit** icon.
  The Tag Editor starts.



2. Login to the MXChange server

The **Login** dialog box appears. You can login to an MXChange server running on the same computer or on a different one you are connected to via TCP/IP:



Enter the following fields:

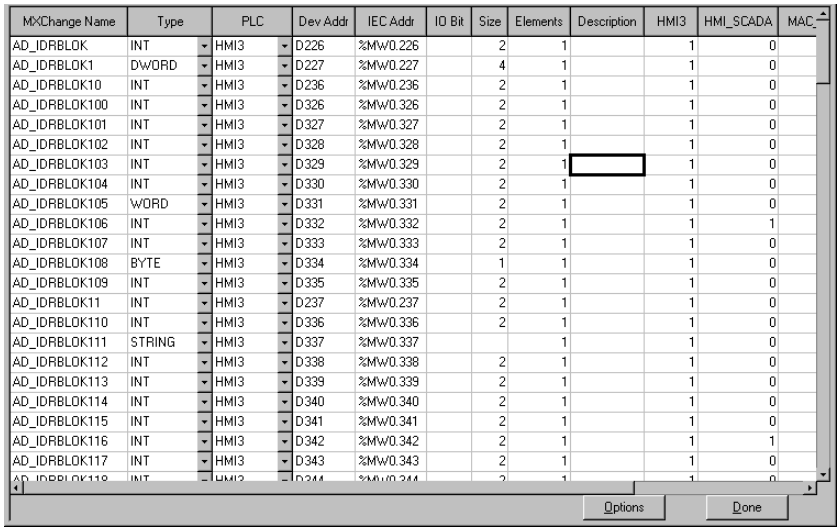
Server Name: TCP/IP address of the MXChange server (initially 127.0.0.1 for the same computer)

User Name: **Admin**

Password: **admin**

Note: *The server distinguishes upper-case and lower-case characters within the user name and password.*

3. The Tag Editor window



MXChange Name	Type	PLC	Dev Addr	IEC Addr	IO Bit	Size	Elements	Description	HMI3	HMI_SCADA	MAC_
AD_IDRBLOK	INT	HMI3	D226	%MW0.226		2	1		1	0	
AD_IDRBLOK1	DWORD	HMI3	D227	%MW0.227		4	1		1	0	
AD_IDRBLOK10	INT	HMI3	D236	%MW0.236		2	1		1	0	
AD_IDRBLOK100	INT	HMI3	D326	%MW0.326		2	1		1	0	
AD_IDRBLOK101	INT	HMI3	D327	%MW0.327		2	1		1	0	
AD_IDRBLOK102	INT	HMI3	D328	%MW0.328		2	1		1	0	
AD_IDRBLOK103	INT	HMI3	D329	%MW0.329		2	1		1	0	
AD_IDRBLOK104	INT	HMI3	D330	%MW0.330		2	1		1	0	
AD_IDRBLOK105	WORD	HMI3	D331	%MW0.331		2	1		1	0	
AD_IDRBLOK106	INT	HMI3	D332	%MW0.332		2	1		1	1	
AD_IDRBLOK107	INT	HMI3	D333	%MW0.333		2	1		1	0	
AD_IDRBLOK108	BYTE	HMI3	D334	%MW0.334		1	1		1	0	
AD_IDRBLOK109	INT	HMI3	D335	%MW0.335		2	1		1	0	
AD_IDRBLOK11	INT	HMI3	D237	%MW0.237		2	1		1	0	
AD_IDRBLOK110	INT	HMI3	D336	%MW0.336		2	1		1	0	
AD_IDRBLOK111	STRING	HMI3	D337	%MW0.337			1		1	0	
AD_IDRBLOK112	INT	HMI3	D338	%MW0.338		2	1		1	0	
AD_IDRBLOK113	INT	HMI3	D339	%MW0.339		2	1		1	0	
AD_IDRBLOK114	INT	HMI3	D340	%MW0.340		2	1		1	0	
AD_IDRBLOK115	INT	HMI3	D341	%MW0.341		2	1		1	0	
AD_IDRBLOK116	INT	HMI3	D342	%MW0.342		2	1		1	1	
AD_IDRBLOK117	INT	HMI3	D343	%MW0.343		2	1		1	0	
AD_IDRBLOK118	INT	HMI3	D344	%MW0.344		2	1		1	0	

Options Done

The tag values may be modified directly in the spreadsheet cells.

To save the changes, use the right mouse button menu. There is also an option to save all changes automatically in the **Edit** tab of the options dialog (see page 5-45).

To edit a tag more detailed, double-click on the tag to display the detailed editing dialog box.

The list may be sorted by any of the columns in any order. To sort the list click on the heading of the column by which the list is to be sorted.

The right mouse button menu available from the spreadsheet includes options to add a tag to a project or remove a tag from a project. This can be used to export tags from one project into others.

To enter tags following a pattern, take the following steps:

① In the **Options** dialog box, select **Auto Tag**.

② Select one or more projects in the list.

③ Click **Add / Remove Patterns**.

④ Select **MXChange Name**.

⑤ Enter a pattern, e.g. “Tag:10:1" for Tag1, Tag2, Tag3 ... Tag10. Any fields may be added with a similar pattern format.

⑥ Select **Add Tag** from the right mouse button menu and the tags will have the details selected as patterns.

6.2 Program exit

Click Done to exit the external Tag Editor.

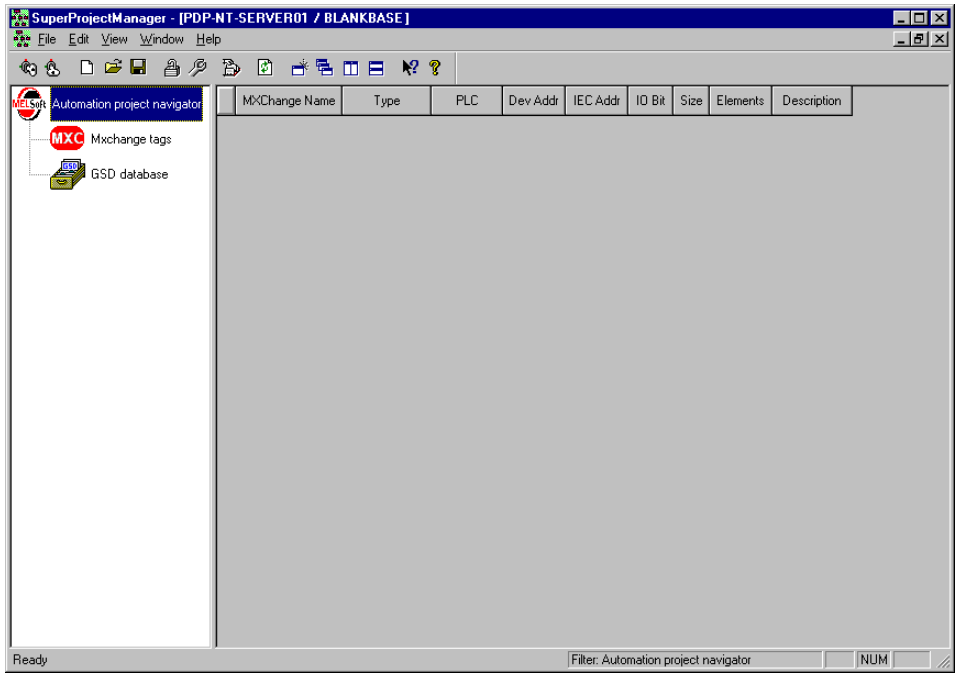
7 Working with Nodes in MXChange

This chapter describes how to create nodes in an automation project in MXChange.

The standard procedure to integrate projects (e.g. MELSEC MEDOC* plus *PLC projects) is described in chapter 4, "Getting started".

7.1 Starting the Super Project Manager

Start the Super Project Manager and login to an MXChange server running on your personal computer or on a different personal computer you can connect to via TCP/IP.
For details on the login, refer to chapter 4, "Getting started".
Here the project starts showing a blank database:



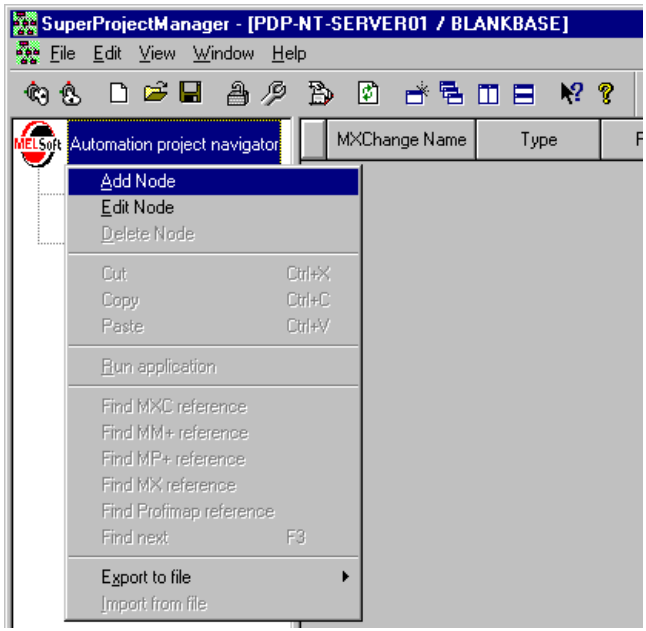
7.2 Creating a new MELSEC MEDOC *plus* project node

Since the complete automation project is represented as a hierarchy of nodes you have to create a new project as new node.

1. Add a new MELSEC MEDOC *plus* node

To add a new MELSEC MEDOC *plus* node:

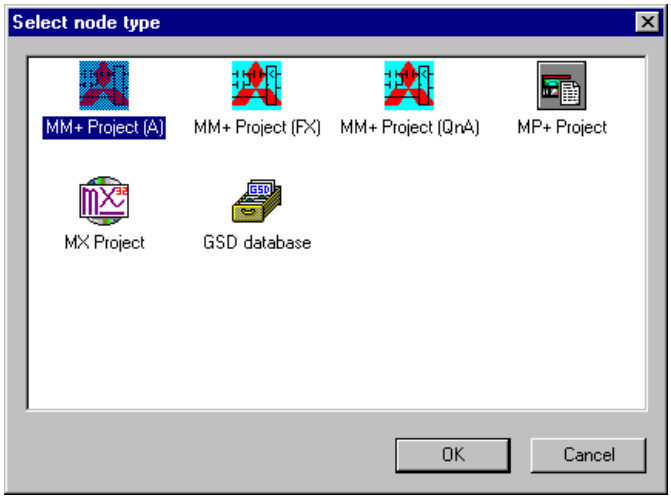
- Right-click on the top-level node **Automation project navigator** to open the context menu.
- Select **Add Node**.



2. Select node type

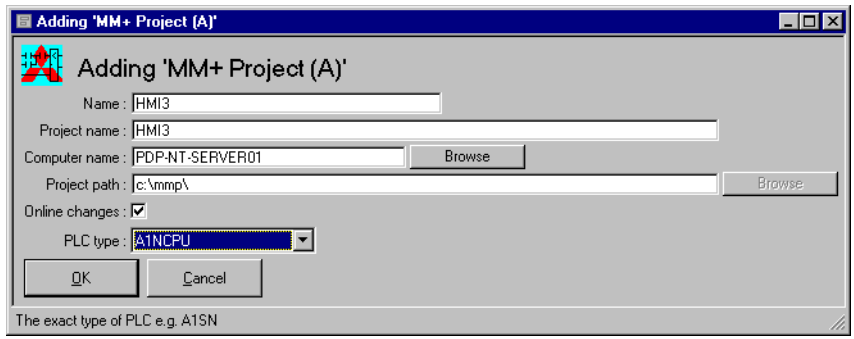
The **Select node type** dialog appears. The contents of this dialog vary depending on the node type to which the new node is to be added. A MELSEC MEDOC *plus* project always represents a PLC of a specific series.

Select the desired PLC series and confirm by clicking OK.



3. Enter project specific information

The following dialog box appears:

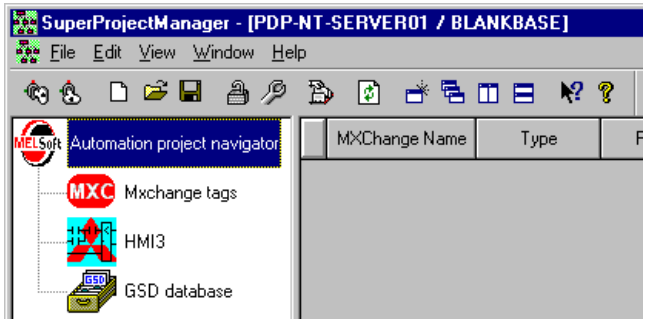


Item	Meaning
Name	MXChange project name to appear in the tree; node name (32 characters max.), normally the same as the project name.
Project name	MM+ project name (8 characters max.)
Computer name	Network name or TCP/IP address of the PC where the project is based
Browse	Browse network for available computers
Project path	Full path to the project file
Browse	Browse for path
Online changes	Box is checked, if online changes are required
PLC type	Exact PLC type

Enter the required project specific information and confirm by clicking OK.

4. New MELSEC MEDOC *plus* project node is created

The new MELSEC MEDOC *plus* project node is added to the automation project navigator:



Note: *Here you do not build up the actual MELSEC MEDOC* plus *project, but only the tree structure within MXChange for a MELSEC MEDOC* plus *project.*

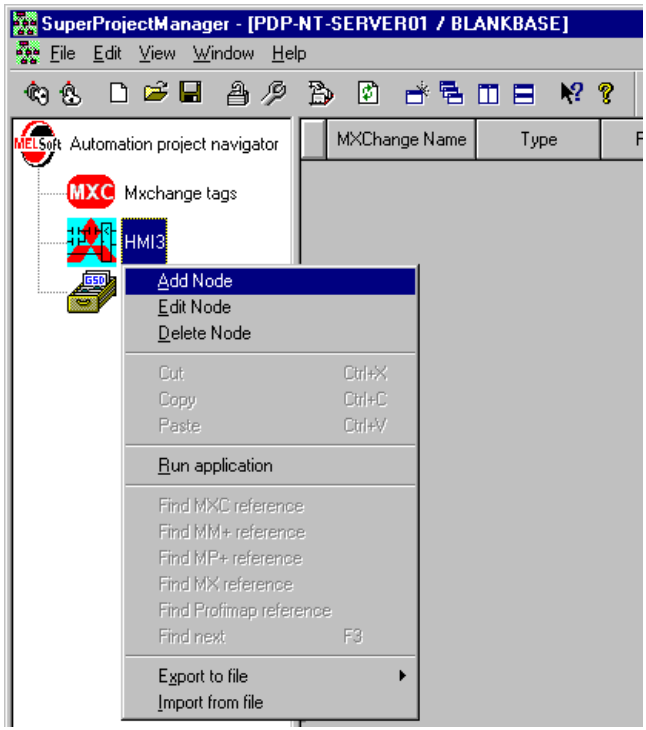
For the integration of a MELSEC MEDOC plus *project in MXChange:*

- *create a separate MELSEC MEDOC* plus *project with the same name, path, and settings*
- *or enter the name, path, and settings of an existing MELSEC MEDOC* plus *project for the MXChange node.*

5. Add a new local I/O node to the MELSEC MEDOC *plus* project node

To add a new local I/O node to the MELSEC MEDOC *plus* project node:

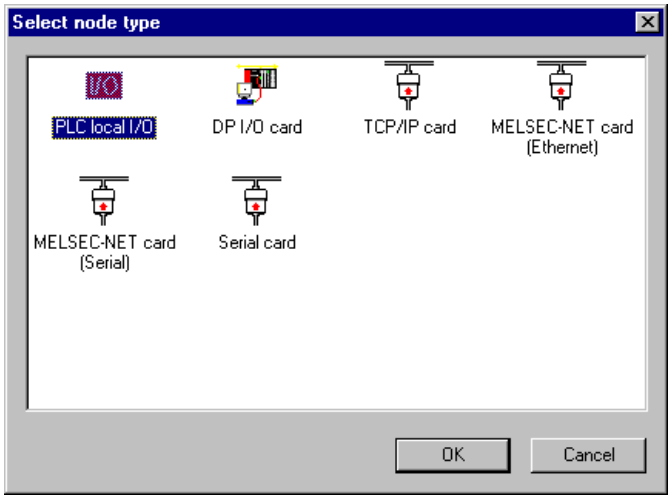
- Right-click on the **MELSEC MEDOC *plus*** project node to open the context menu.
- Select **Add Node**.



6. Select a node type

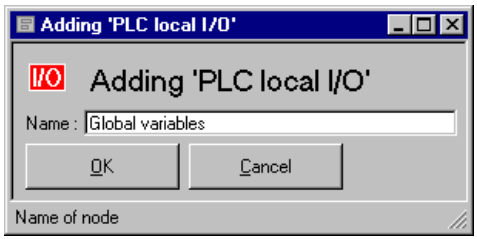
The **Select node type** dialog appears. The contents of this dialog vary depending on the node type to which the new node is to be added. The dialog below shows the available node types for a MELSEC MEDOC *plus* node.

Select the desired I/O type and confirm by clicking OK:



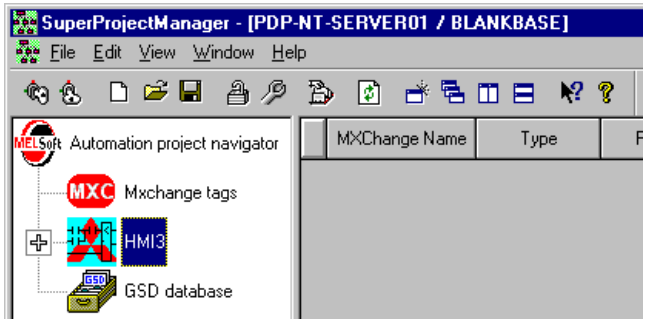
7. Enter a name for the PLC local I/O

Enter a name for the PLC local I/O and confirm by clicking OK:



8. New PLC local I/O is created

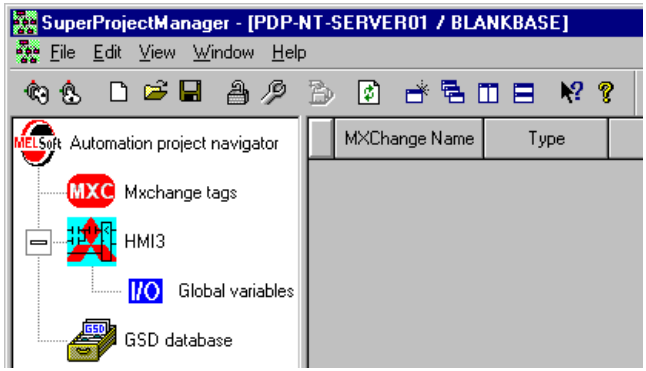
The new PLC local I/O in the MELSEC MEDOC *plus* project is created. However, it is not yet displayed, as the MELSEC MEDOC *plus* project is not expanded:



9. Expand MELSEC MEDOC *plus* node

To expand the MELSEC MEDOC *plus* project, click on ⊞ .

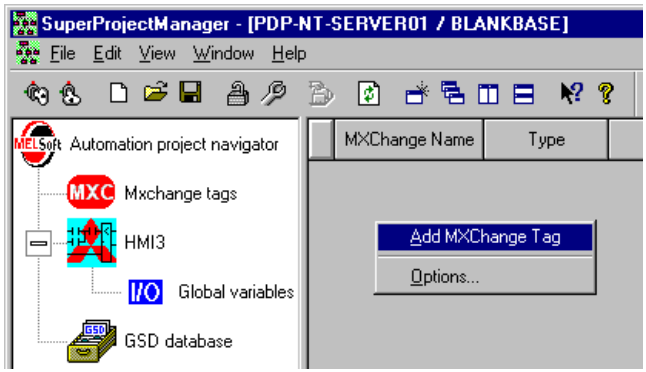
Now, the new PLC local I/O is displayed:



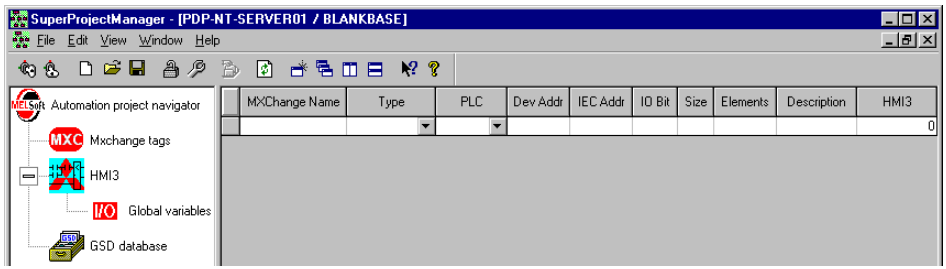
10. Add a new tag to the PLC local I/O

To add a new tag to the PLC local I/O:

- Right-click on the Tag Editor window to open the context menu.
- Select **Add MXChange Tag**.



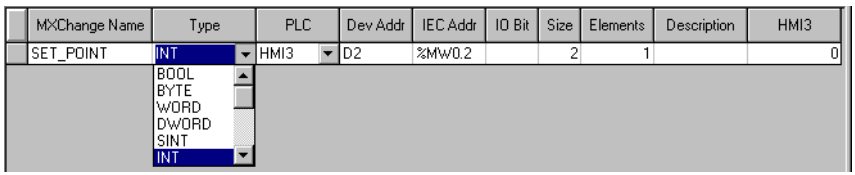
A blank row for the new MXChange tag will be added:



11. Edit the new MXChange tag

The new tag can be edited directly in the Tag Editor window.

Enter the required values:

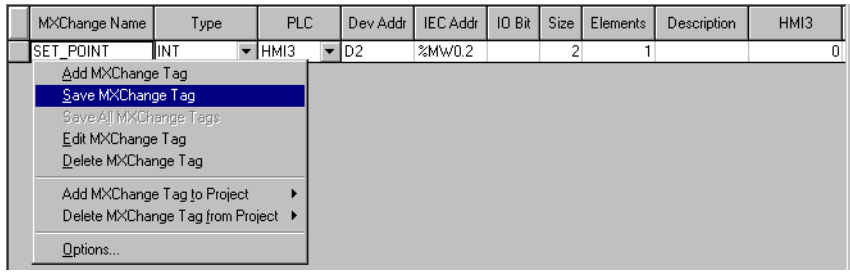


The variable type can be selected from a drop-down list. The IEC address is calculated automatically.

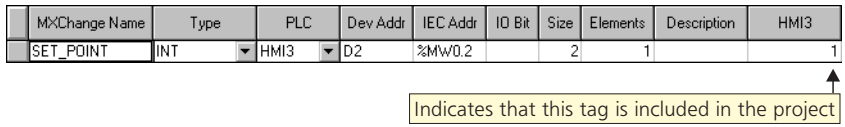
12. Save the MXChange tag

To save the MXChange tag:

- Right-click on the edited tag to open the context menu.
- Select **Save MXChange Tag**.

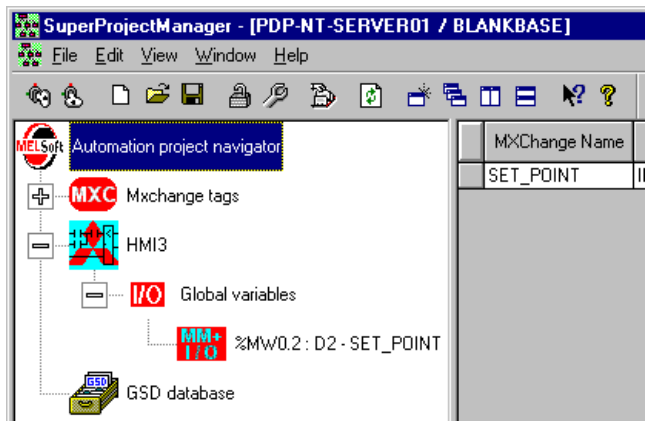


When the tag has been saved, it will be referenced to the according project. The references to different projects are indicated by the digit below the project name:



13. New tag is represented as node

In the automation project navigator the new tag is represented as child node of the MELSEC MEDOC *plus* I/O node and also added to the **MXChange Tags**:



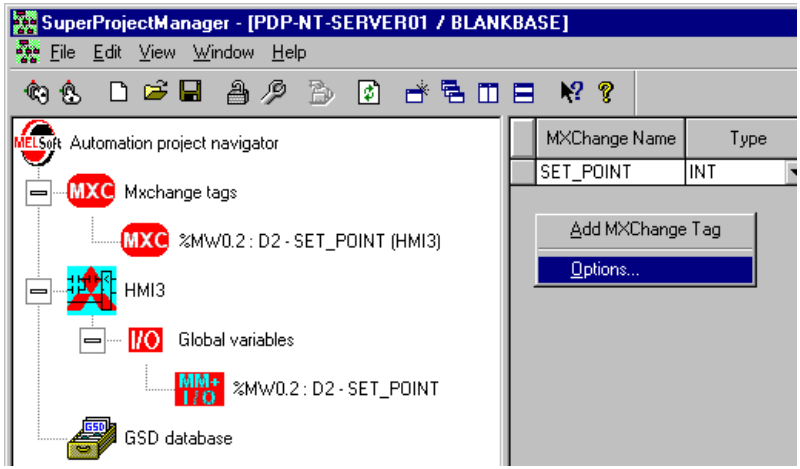
Click on ⊞ to expand a node.
Click on ⊟ to collapse a node.

14. Configure the automatic tag entry function

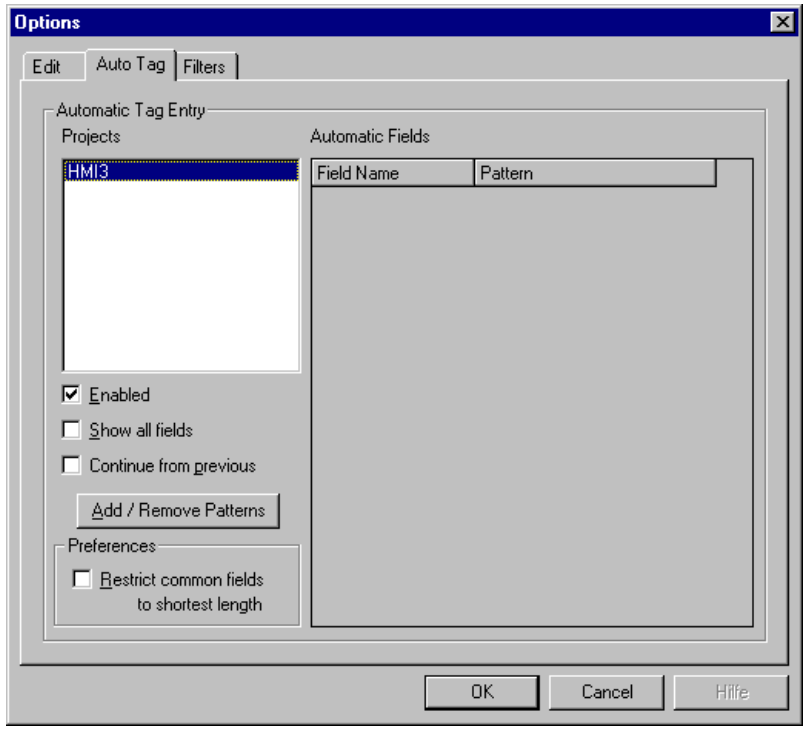
When adding a series of similar MXChange tags, a number of patterns can be filled automatically. For details see section "Automatic tag entry" on page 5-36.

To configure the automatic tag entry function:

- Right-click on the Tag Editor window to open the context menu.
- Select **Options**.



- Click on the **Auto Tag** tab to open the following dialog.
- Select the project to be expanded.



Specify the fields to be entered automatically:

To specify the fields to be entered automatically you have two alternative choices:

A. Select **all** relevant fields for the automatic entry and edit the contained patterns for these fields via the **Show all fields** function (see below).

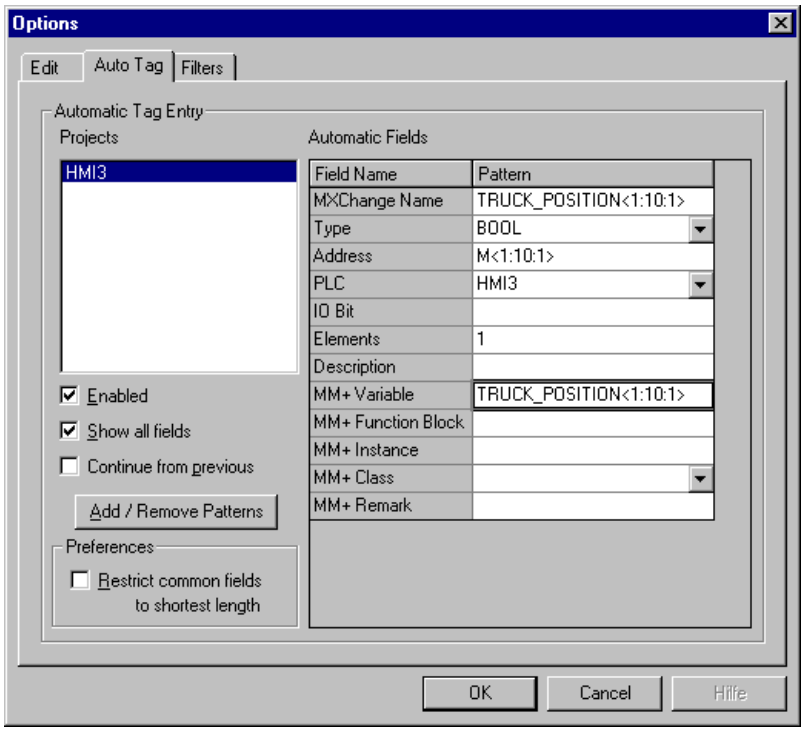
   or

B. Select **individual** patterns for the automatic entry and edit their contents via the **Add / Remove Patterns** function as described below.

Choice A.: Show all fields

To show all fields:

- Activate the checkbox **Show all fields** to list all fields relevant for the selected project.
- Edit the corresponding patterns in the window shown below.



To increase or decrease automatically the numbers, the following syntax has to be chosen:

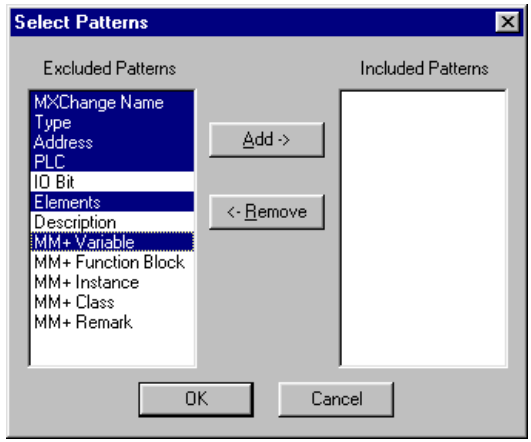
<Start:Finish:Step>

Start is the first numeric value to be replaced.
Finish is the last numeric value to be replaced.
Step is the number to be added to or subtracted from the previously added tag.

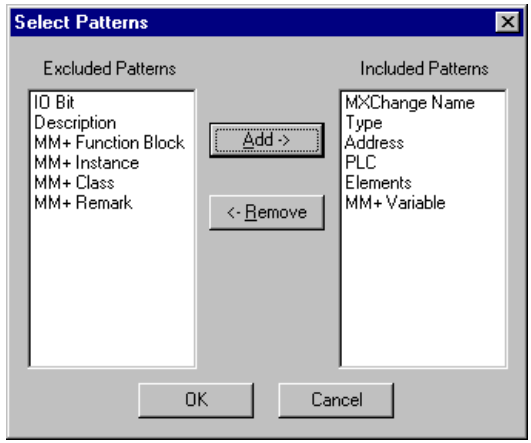
Choice B.: Add / Remove Patterns

To add or remove patterns:

- Click on Add / Remove Patterns in the **Auto Tag** dialog.
  Now, the **Select Patterns** dialog opens.
- Select the required patterns for the automatic entry.

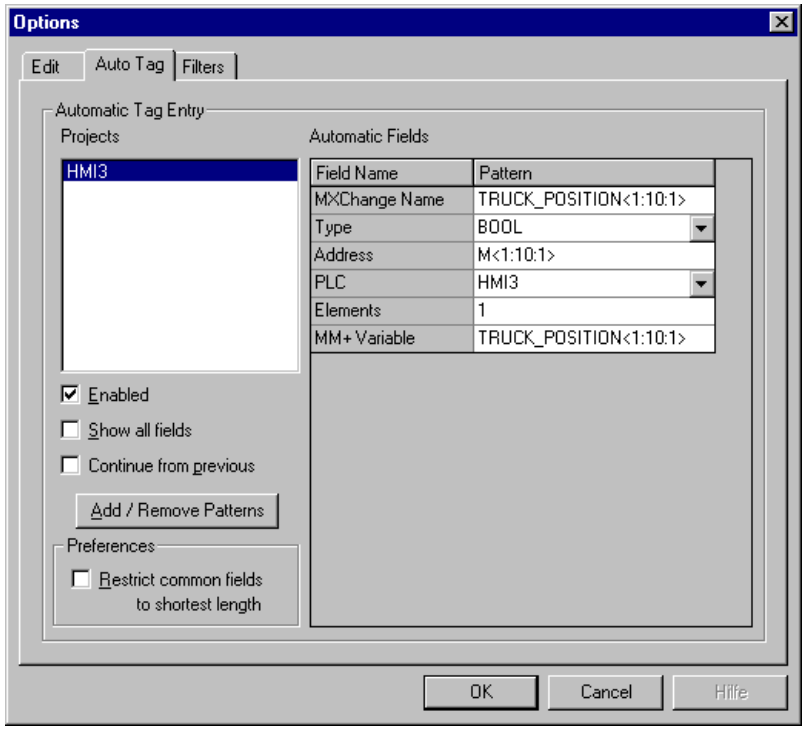


- Click on Add -> to include the selected pattern.



- Confirm your selection by clicking OK .
  Now, you leave this dialog.

- Edit the selected patterns directly in the **Automatic Fields** section:



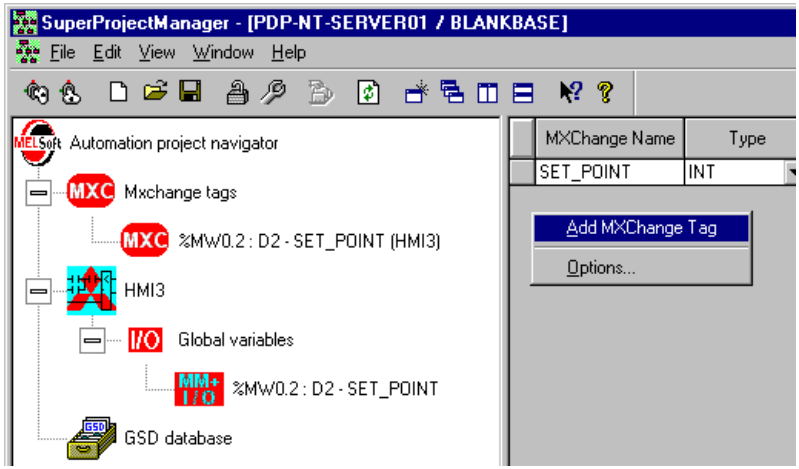
To enable your configuration of the automatic tag entry function:

- Ensure that the **Enabled** checkbox is activated.
- Click on OK to confirm the **Auto Tag** options you have configured.

15. Add a new tag with the automatic tag entry function enabled

To add a new tag with the automatic tag entry function enabled:

- Right-click on the Tag Editor window.
  The context menu opens.
- Select **Add MXChange Tag**.



The new tag is added including the entries in the fields selected for the automatic tag entry function:

MXChange Name	Type	PLC	Dev Addr	IEC Addr	IO Bit	Size	Elements	Description	HMI3
TRUCK_POSITION1	BOOL	HMI3	M1	%MX0.1		0	1		0
SET_POINT	INT	HMI3	D2	%MW0.2		2	1		1

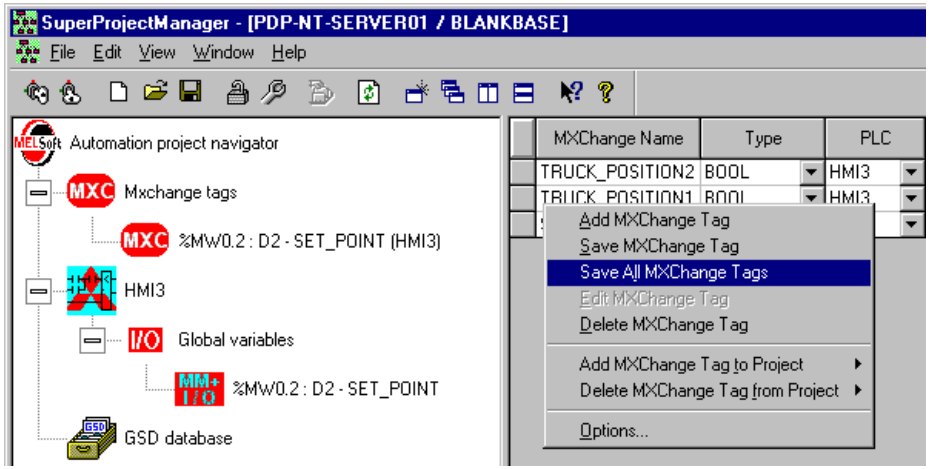
All further tags being added will be increased or decreased and completed automatically.

If you want to disable the automatic tag entry function, disable the automatic tag entry in the **Options**/**Auto Tag** dialog.

16. Save all added tags

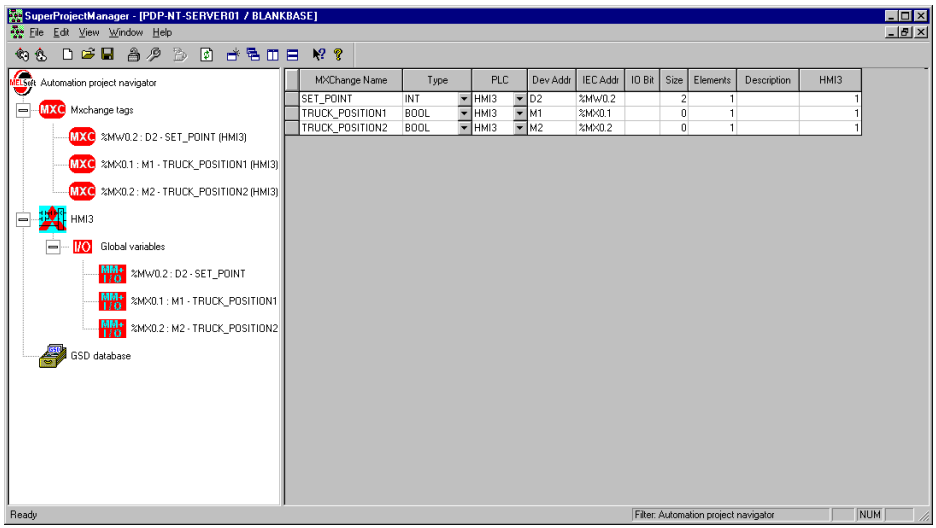
To save all added tags:

- Right-click on the Tag Editor.
  The context menu opens.
- Select **Save All MXChange Tags**.



17. New tags are represented as nodes

In the automation project navigator the new tags are represented as child nodes of the MELSEC MEDOC *plus* project and also added to the **MXChange Tags**:



18. Add a new I/O card to the MELSEC MEDOC *plus* project

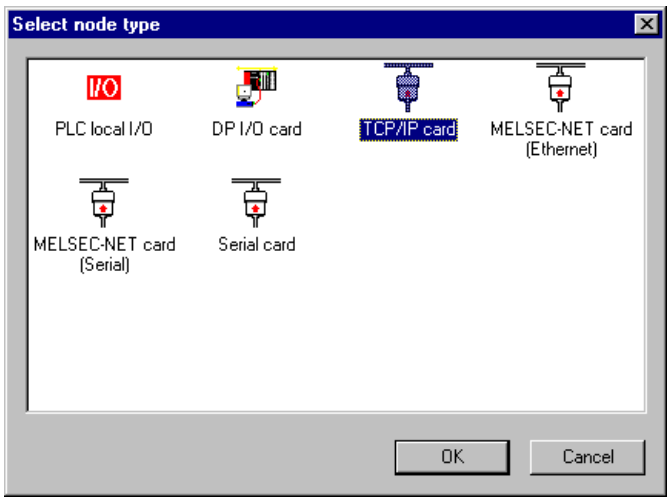
To add a new I/O card to the MELSEC MEDOC *plus* project:

- Right-click on the MELSEC MEDOC *plus* project.
  The context menu opens.
- Select **Add Node**.

19. Select node type

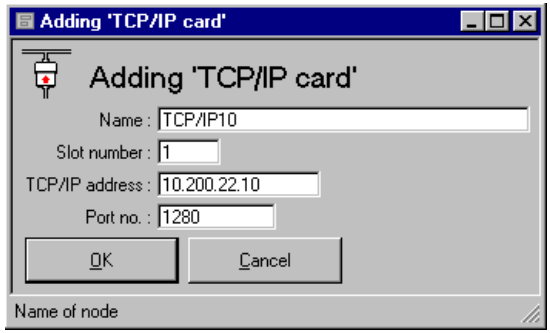
The **Select node type** dialog appears. The contents of this dialog vary depending on the node type to which the new node is to be added.

Select the desired I/O card. Confirm by clicking OK:



20. Enter node specific information

Enter the required node specific information and confirm by clicking OK.



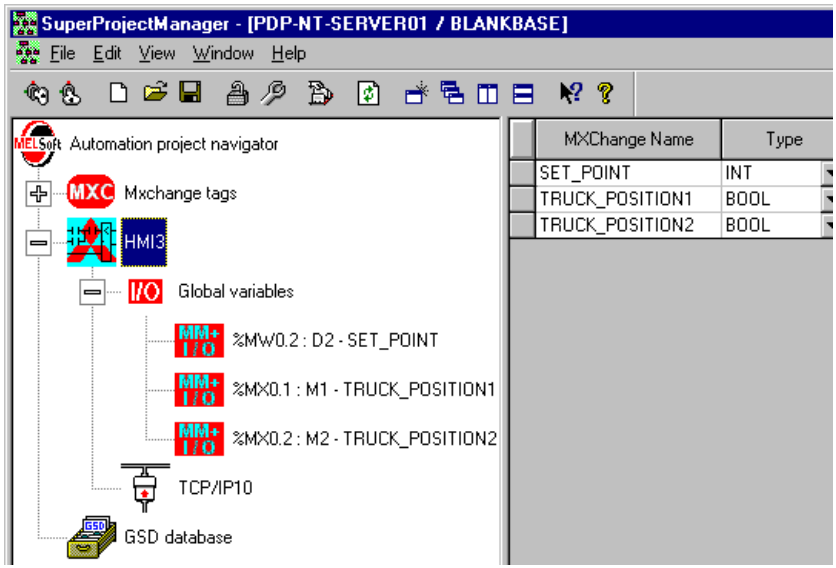
Item	Meaning
Name	Node name
Slot number	Slot number in the PLC
TCP/IP address	TCP/IP address of the card
Port no.	Port number to connect the card to

Note: *If you intend to connect a MELSEC MEDOC* plus *project and an MX SCADA project, ensure that the I/O card of the MELSEC MEDOC* plus *project corresponds to the MX driver and the respective channel and device of the MX SCADA project. The driver, channel, and device of the MX SCADA project must be added manually to MXChange.*

21. New I/O point is created as node

The new TCP/IP connection is created and displayed as new node in the automation project navigator.

The screen below shows the complete MELSEC MEDOC *plus* project.



7.3 Creating a new MAC Programmer+ project node

In the following the creation of a new MAC Programmer+ project node is described.

1. Add a new MAC Programmer+ project node

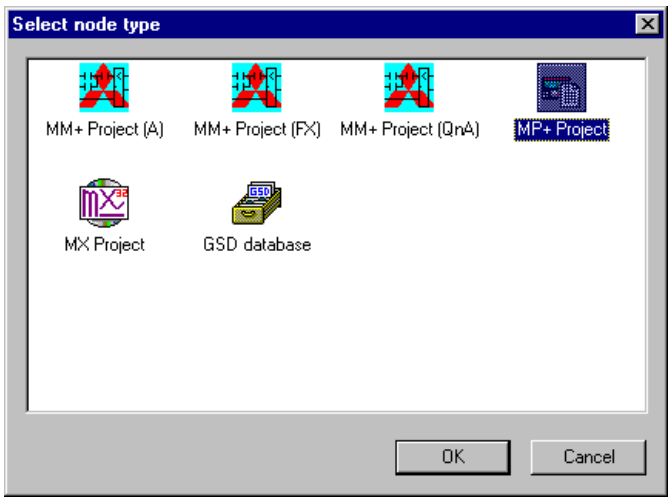
To add a new MAC Programmer+ project node:

- Right-click on the top-level node **Automation project navigator**.
  The context menu opens.
- Select **Add Node**.

2. Select node type

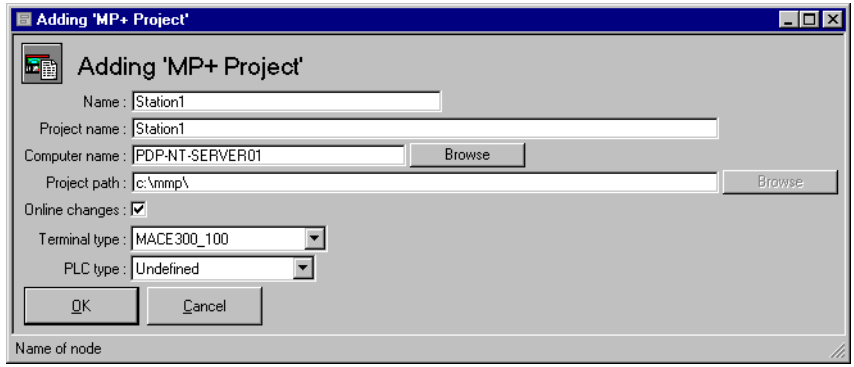
The **Select node type** dialog appears. The contents of this dialog vary depending on the node type to which the new node is to be added.

Select the MP+ project and confirm by clicking OK:



3. Enter project specific information

The following dialog box appears:

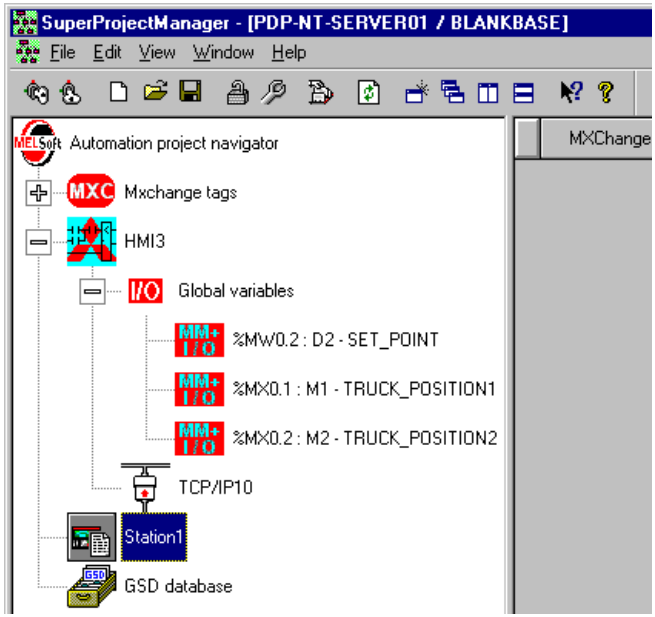


Item	Meaning
Name	Node name
Project name	MP+ project name
Computer name	Network name or TCP/IP address of the PC where the project is based
Browse	Browse network for available computers
Project path	Full path to the project file
Browse	Browse for path
Online changes	Box is checked, if online changes are required
Terminal type	Terminal type being configured
PLC type	Exact PLC type connected

Enter the required project specific information and confirm by clicking OK.

4. New MAC Programmer+ project is created

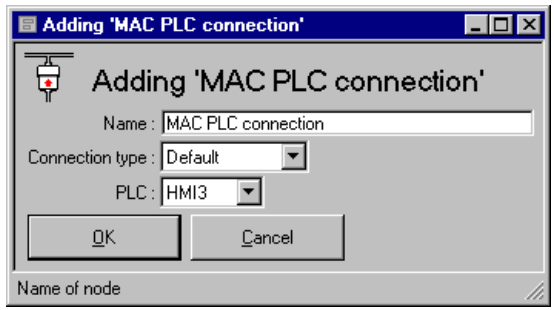
The new MAC Programmer+ project is added to the automation project navigator:



5. Add a new MAC PLC connection to the MAC Programmer+ project

To add a new MAC PLC connection to the MAC Programmer+ project:

- Right-click on the **MAC Programmer**+ project.
  The context menu opens.
- Select **Add Node**.
  The dialog **Adding "MAC PLC connection"** appears:

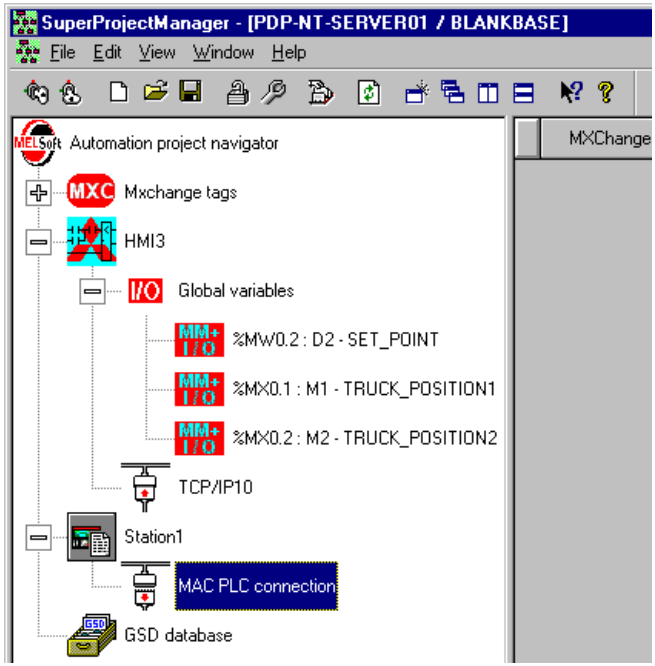


Item	Meaning
Name	Node name
Connection type	Connection type to the PLC
PLC	PLC containing the data

- Enter the node specific information.
  The connection type and PLC can be selected from drop-down lists.
- Confirm by clicking OK .

6. New MAC PLC connection is created

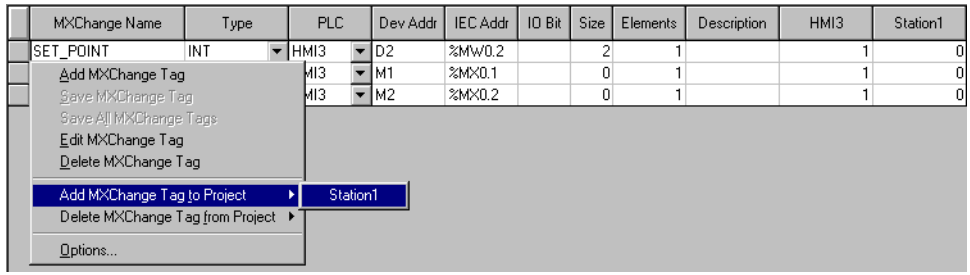
The new MAC PLC connection is added to the automation project navigator:



7. Add MXChange tag to MAC Programmer+ project

To add an MXChange tag to the MAC Programmer+ project:

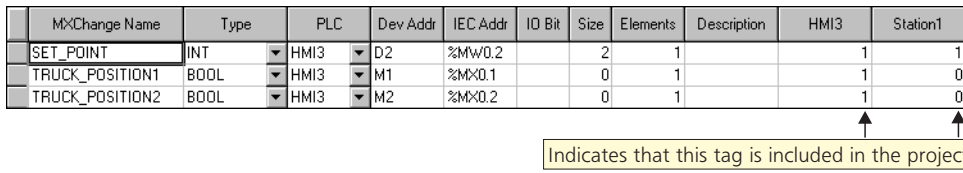
- Right-click on the MXChange tag you want to add to the MAC Programmer+ project.
  The context menu opens.
- Select **Add MXChange Tag to Project**.



All projects to which the MXChange tag does not refer are listed. In the example above the MXChange tag SET_POINT does not refer to the MAC Programmer+ project. To add the selected tag to a certain project, click on this project.

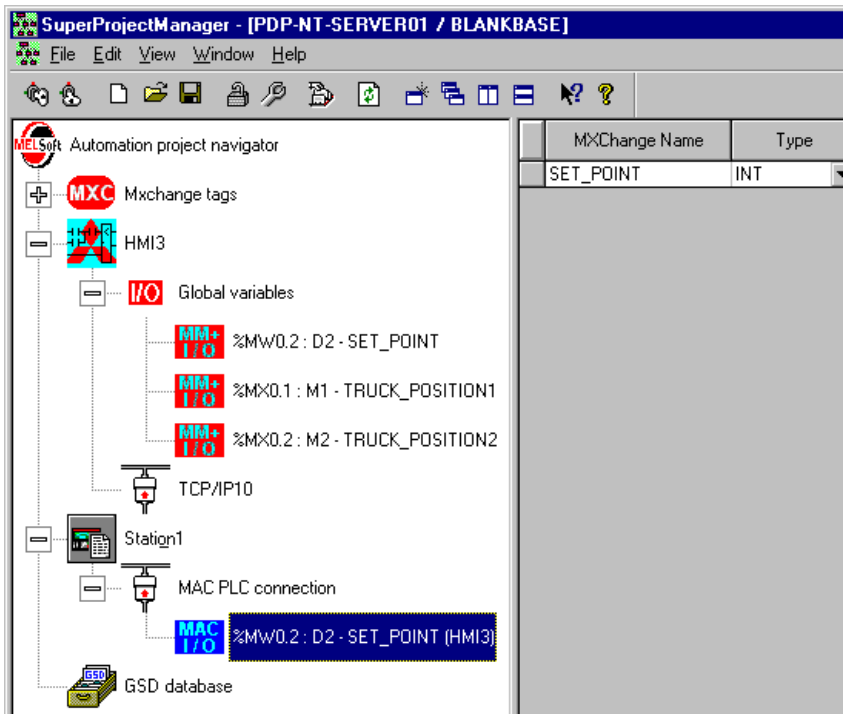
- Click on **MAC_Programmer**

When the tag has been added, it will be referenced to the according project. The references to different projects are indicated by the digit below the project name:



8. New tag is represented as node

In the automation project navigator the new tag is represented as a child node of the MAC PLC connection. The screen below shows the MAC Programmer+ project.



7.4 Creating a new MX SCADA project node

In the following the creation of a new MX SCADA project node is described.

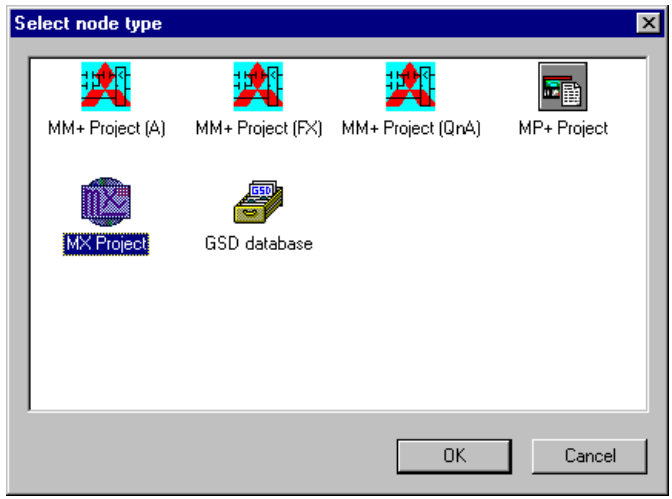
1. Add a new MX SCADA node

To add a new MX SCADA node:

- Right-click on the top level node **Automation project navigator**.
  The context menu opens.
- Select **Add Node**.

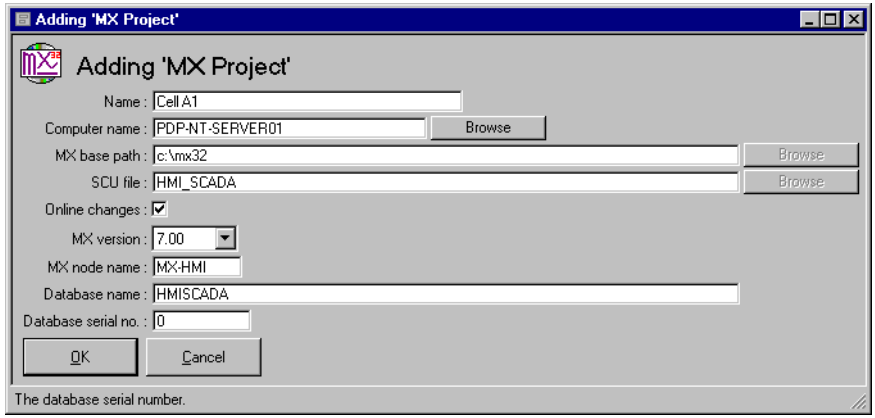
2. Select node type

The **Select node type** dialog appears. The contents of this dialog vary depending on the node type to which the new node is to be added. Select the MX project and confirm by clicking OK:



3. Enter project specific information

The following dialog box appears:

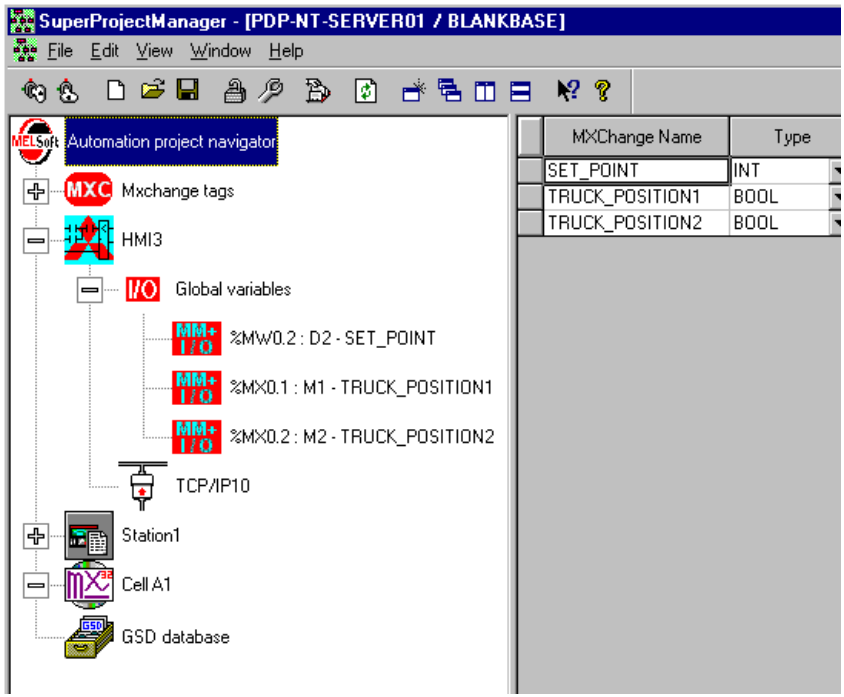


Item	Meaning
Name	Node name
Computer name	Network name or TCP/IP address of the PC where the project is based
Browse	Browse network for available computers
MX base path	Base path of the MX directory
Browse	Browse for path
SCU file	Full path and file name of the system configuration file
Browse	Browse for path
Online changes	Box is checked, if online changes are required
MX version	Version of MX
MX node name	Network name for this MX node
Database name	Full path and file name of the process database (PDB) file
Database serial no.	Serial number of database

Enter the required project specific information and confirm by clicking OK.

4. New MX SCADA project is created

The new MX SCADA project is added to the automation project navigator:

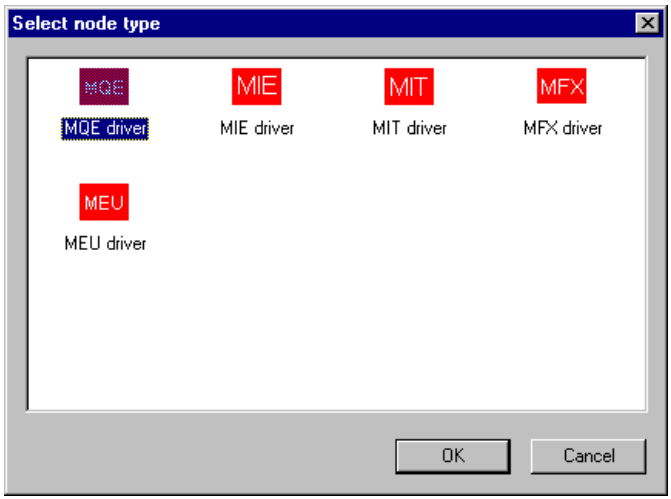


5. Add a new driver to the MX SCADA project

To add a new driver to the MX SCADA project:

- Right-click on the MX SCADA project.
  The context menu opens.
- Select **Add Node**.
  The **Select node type** dialog appears.

The contents of this dialog vary depending on the node type to which the new node is to be added. Select a driver type and confirm by clicking OK:



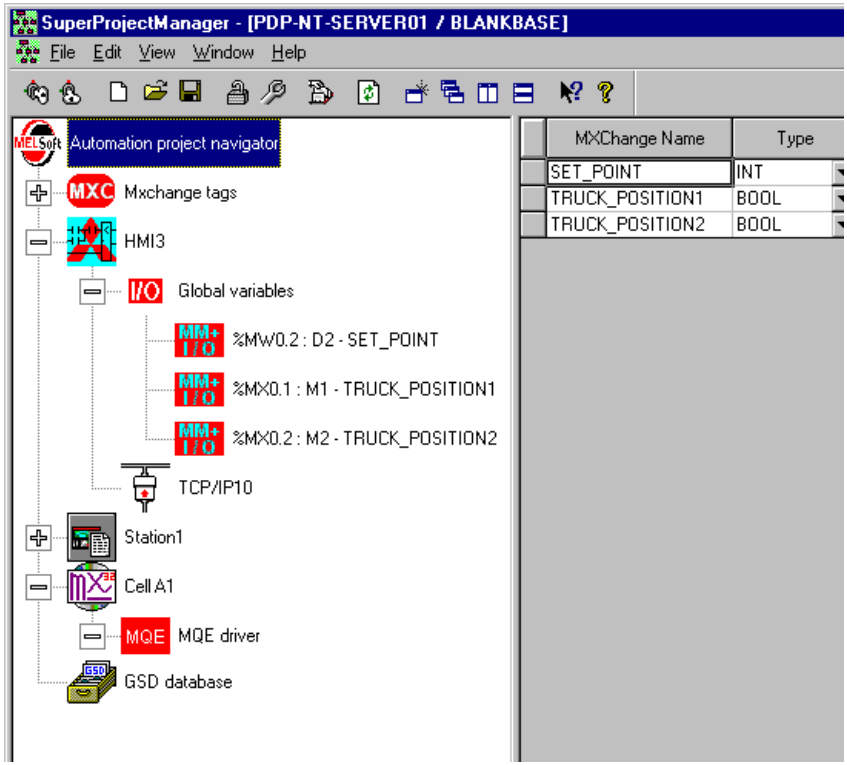
6. Enter node specific information

The following dialog box appears:

Enter the driver name and confirm by clicking OK.

7. New driver node is created

The new driver in the MX SCADA project is created. In this case it is an MQE driver.



8. Add a new MQE channel

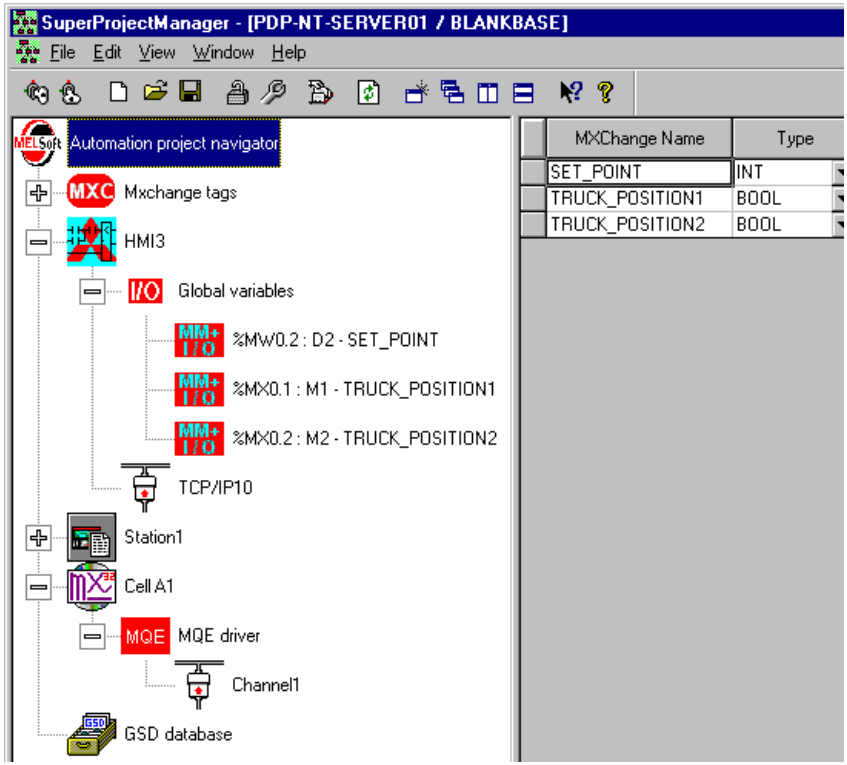
To add a new MQE channel:

- Right-click on the MQE driver node.
  The context menu opens.
- Select **Add Node**.
  The dialog **Adding "MQE channel"** appears.

Enter the node specific information and confirm by clicking OK .

9. New MQE channel node is created

The new MQE channel in the MX SCADA project is created:

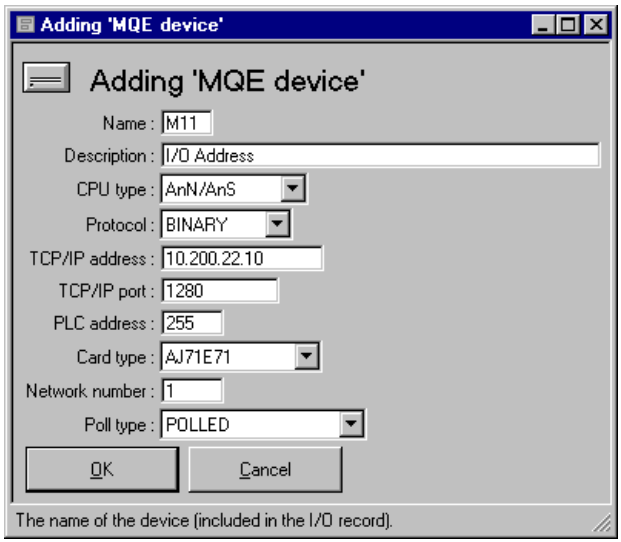


10. Add a new MQE device

To add a new MQE device:

- Right-click on the MQE channel node.
  The context menu opens.
- Select **Add Node**.

The dialog **Adding "MQE device"** appears:



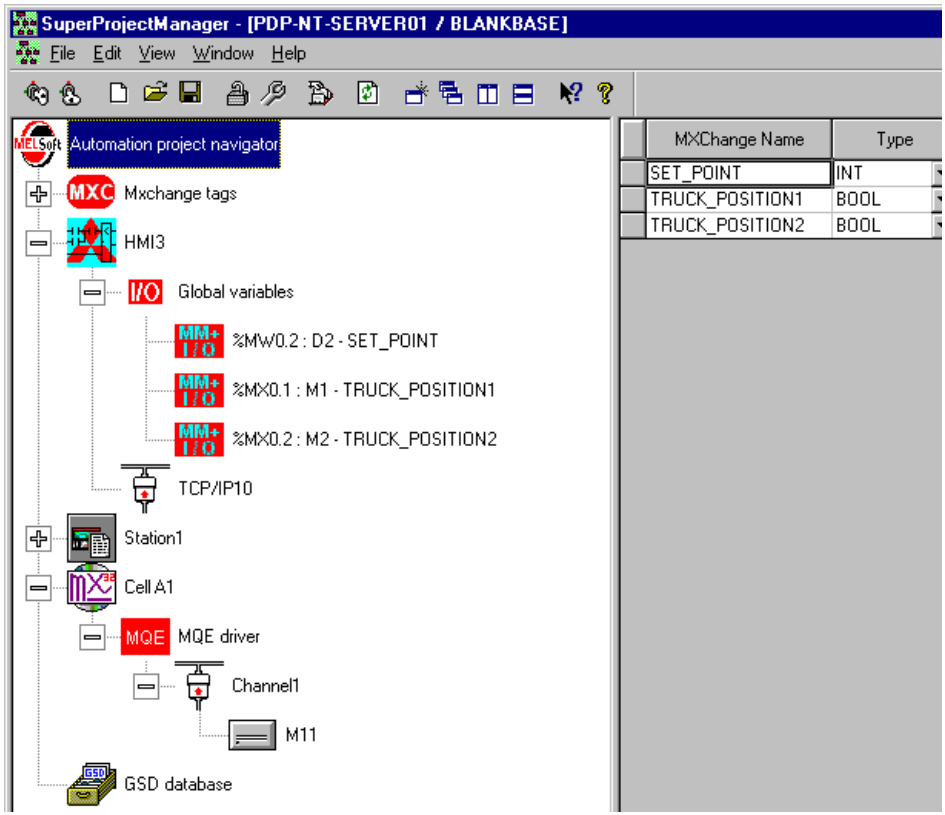
Item	Meaning
Name	Device name (included in the I/O record)
Description	Device description
CPU type	Type of CPU to which the device is connected
Protocol	Protocol to use
TCP/IP address	Primary TCP/IP address to which the driver is connected
TCP/IP port	TCP/IP port at the primary address
PLC address	PLC address to which the driver is connected (0-64: slave, 255: master)
Card type	I/O card type in the PLC
Network number	Network number (0-239)
Poll type	Poll type (polled or unsolicited)

Enter the node specific information. The CPU type, protocol, card type, network number, and poll type can be selected from drop-down lists. Confirm by clicking OK .

Note: *If you intend to connect a MELSEC MEDOC* plus *project and an MX SCADA project, ensure that the I/O card of the MELSEC MEDOC* plus *project corresponds to the MX driver and the respective channel and device of the MX SCADA project. The driver, channel, and device of the MX SCADA project must be added manually to MXChange.*

11. New MQE device node is created

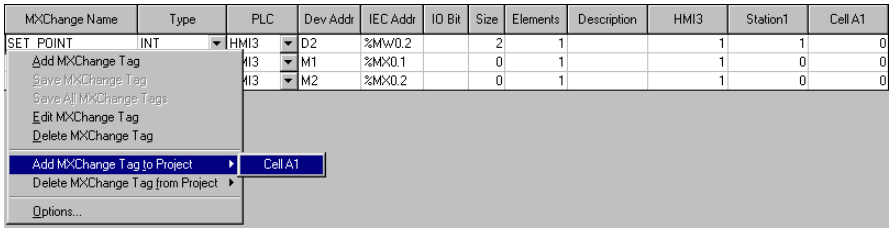
The new MQE device node in the MX SCADA project is created:



12. Add MXChange tag to MX SCADA project

To add an MXChange tag to MX SCADA project:

- Right-click in the Tag Editor on the MXChange tag you want to add to the MX SCADA project.
  The context menu opens.
- Select **Add MXChange Tag to Project**.

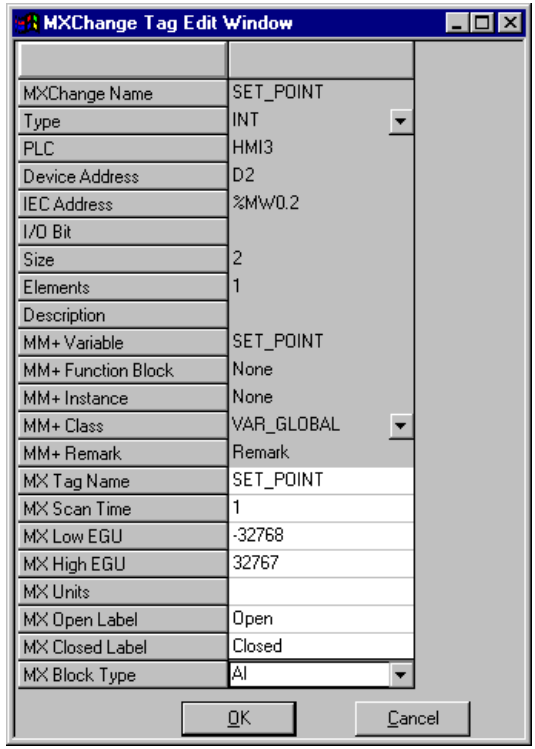


All projects to which the MXChange tag does not refer are listed. In the example above the MXChange tag SET_POINT does not refer to the MX SCADA project. To add the selected tag to a certain project, click on this project.

- Click on **MX-HMI_SCADA**

13. Edit MX SCADA tag

The **MXChange Tag Edit Window** opens automatically:

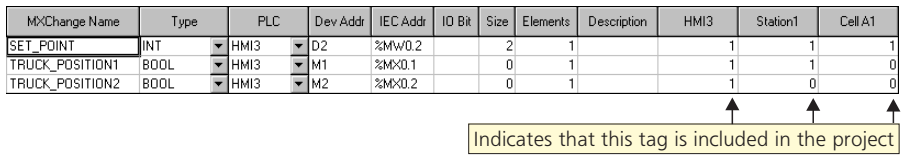


Edit the project specific information and confirm by clicking 

.

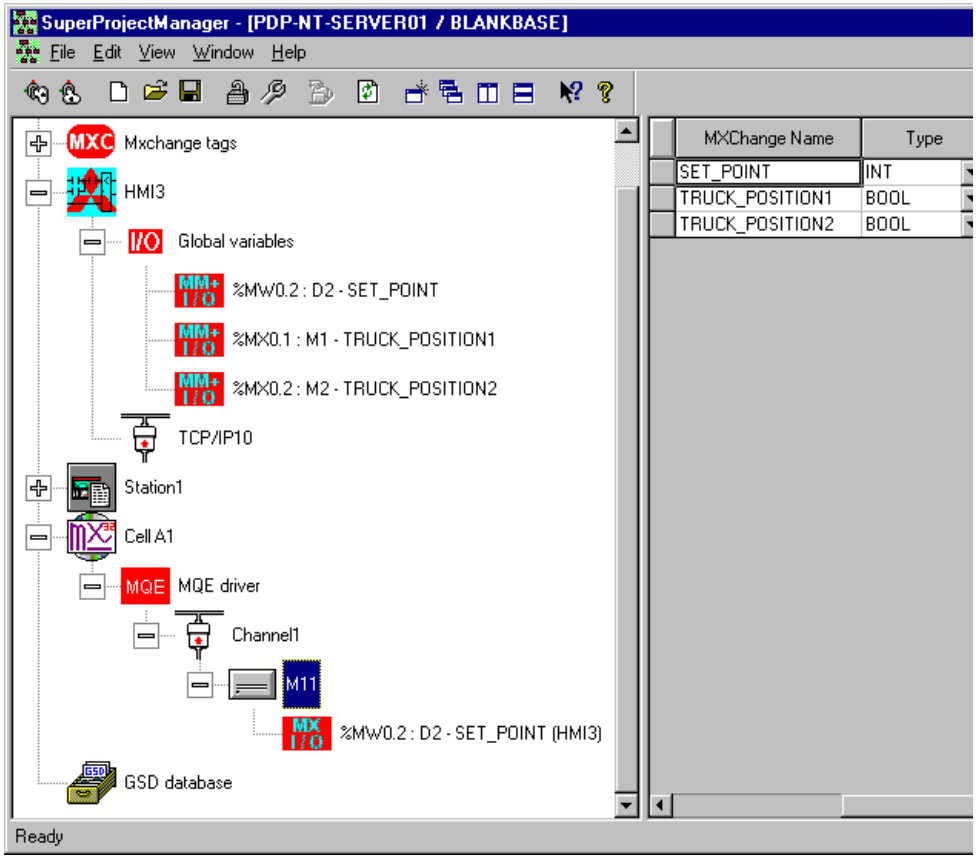
14. Tag is referenced to the MX SCADA project

When the tag has been added, it will be referenced to the according project. The references to different projects are indicated by the digit below the project name:

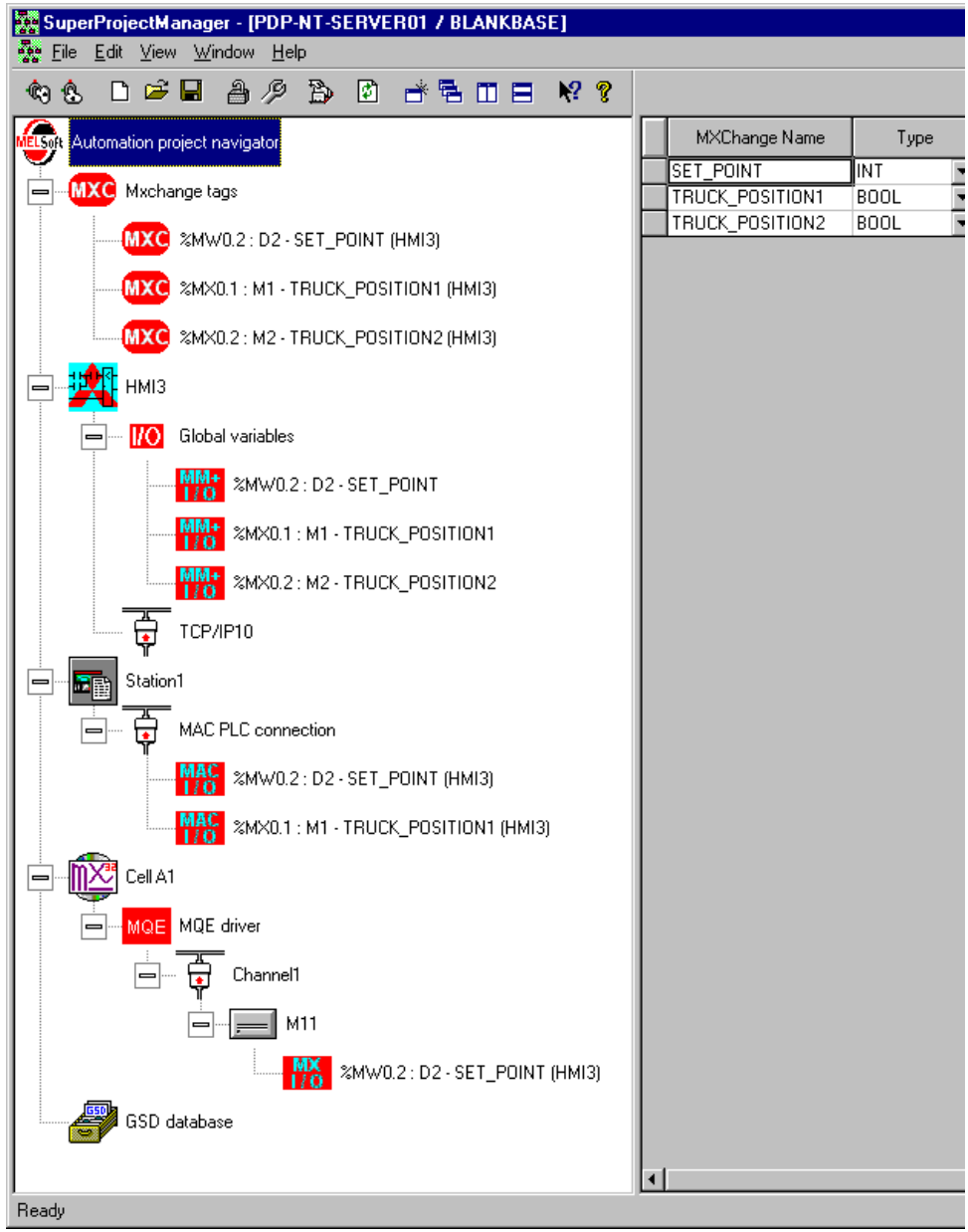


15. MX SCADA tag is represented as node

In the automation project navigator the MX SCADA tag is represented as a child node of the MQE device. The screen below shows the complete MX SCADA project.



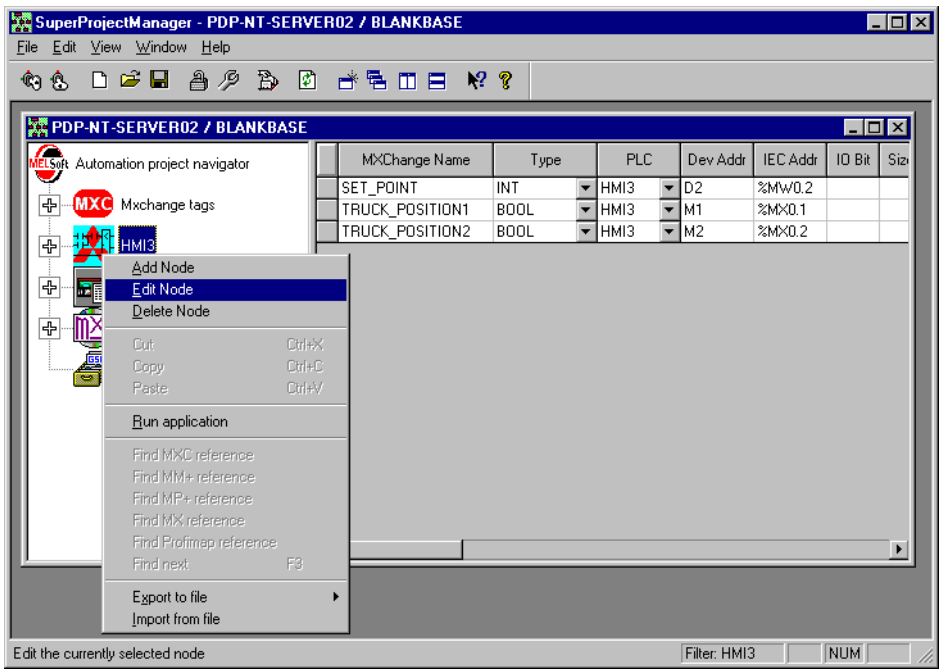
7.5 Overview of the complete automation project tree



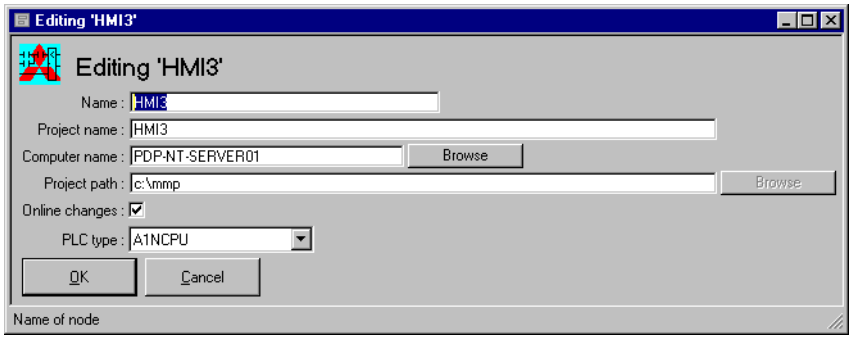
7.6 Editing nodes

To edit nodes:

- Right-click on the node to be edited.
  The automation project navigator context menu opens.
- Select **Edit Node**.



The **Editing** node dialog appears. In the example shown below a MELSEC MEDOC *plus* project node is edited:



The entries available for editing depend on the node type which has been selected.

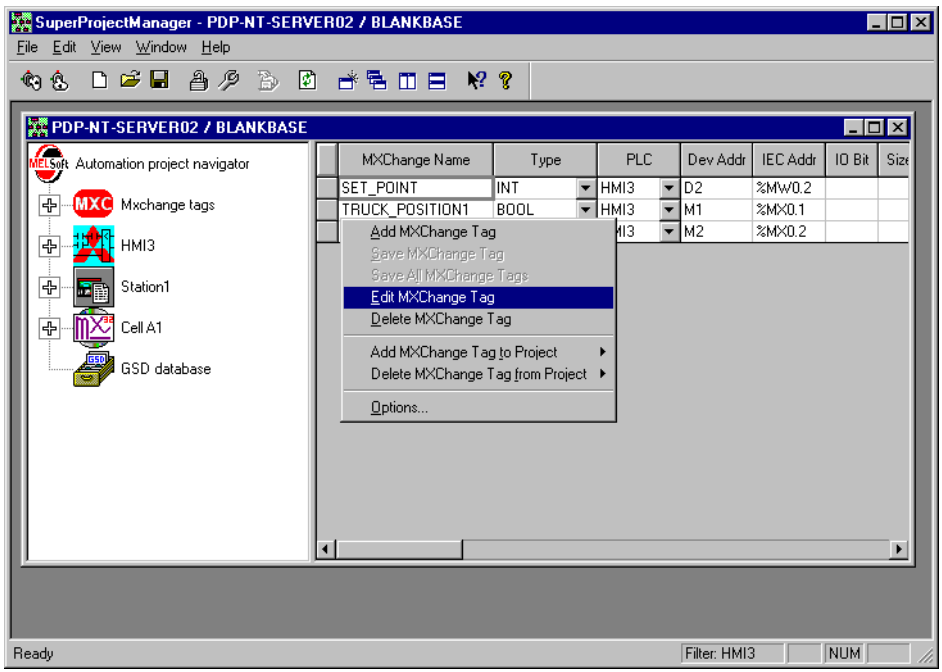
Edit node dialog items:

Item	Meaning
Name	MXChange project name to appear in the tree; node name (32 characters max.), normally the same as the project name.
Project name	MM+ project name (8 characters max.)
Computer name	Network name or TCP/IP address of the PC where the project is based
Project path	Full path to the project file
Online changes	Box is checked, if online changes are required
PLC type	Exact PLC type

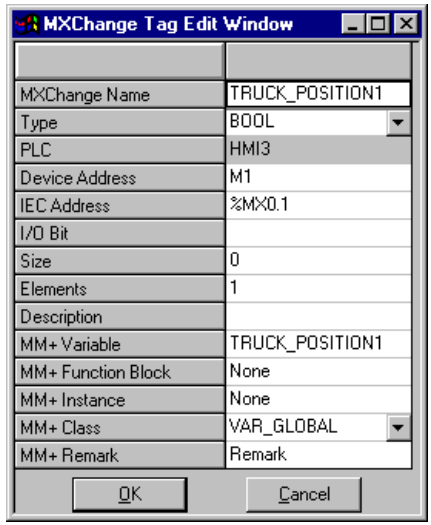
7.7 Editing tags

To edit tags:

- Edit the entries in the Tag Editor grid
- or right-click on the tag to be edited to open the Tag Editor context menu and select **Edit MXChange Tag**:



The **MXChange Tag Edit Window** appears. In the example shown below a MELSEC MEDOC *plus* variable is edited:



The entries available for editing depend on the node type which has been selected.

Edit Tag dialog items:

Item	Meaning
MXChange Name	Variable name in MXChange
Type	I/O type
PLC	MM+ PLC/project name
Device Address	Device address of the variable (MITSUBISHI format)
IEC Address	Device address of the variable (IEC format)
I/O Bit	I/O bit within an analog word or -1
Size	Size of elements for an array
Elements	Number of elements for an array
Description	Variable description
MM+ Variable	Variable name in MM+
MM+ Function Block	Function block name in MM+
MM+ Instance	Function block instance in MM+
MM+ Class	Variable class in MM+
MM+ Remark	Additional comment in MM+

Note: *Do not forget to save your individual automation project to get the changes made in MXChange.*

8 Common Database Synchronisation

8.1 Synchronisation and consistency mechanism

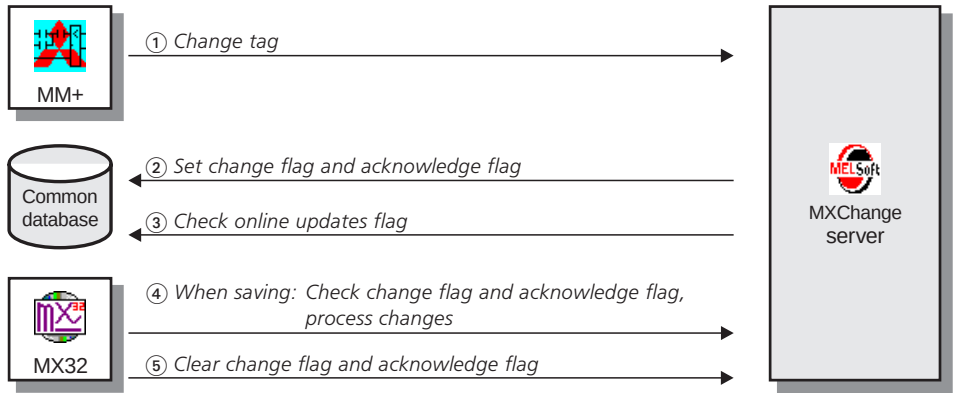
The configuration programs process changes when starting up, saving, and optionally during normal operation.

There are six flags for every node where a change is relevant to one of the configuration programs. Two flags each are set for adding, deleting, or changing. One flag indicates that the change occurred, the other indicates that it has not yet been processed. When an MXChange tag is added, deleted, or changed, the appropriate flags are set.

Every configuration program provides an **Online Updates** feature for MXChange which can be enabled or disabled for any project. If you have enabled online updates, the target configuration program does the change immediately and clears the acknowledge flag. When the configuration is saved - including the changes - the other flag will also be cleared. If the system is shut down although the database has not been saved, the acknowledge flag is set again, so that the change can be retried.

Online Updates

Sequence of a program which does not accept online updates:



① **Change tag**
A configuration program changes a tag, confirms the change (e.g. by saving the database in MELSEC MEDOC *plus*), and passes the details to the MXChange server.

② **Set change flag and acknowledge flag**
The MXChange server sets the change flag and the acknowledge flag for all other configuration programs using the tag.

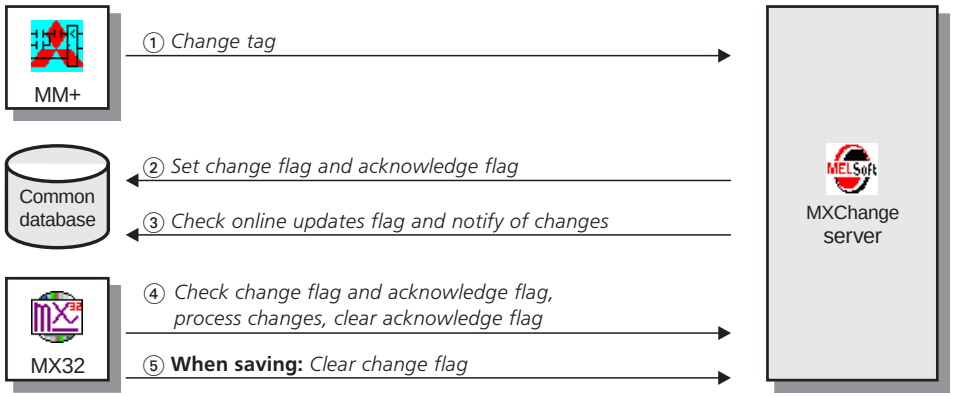
③ **Check online updates flag**
The MXChange server checks the online updates flag of the other configuration programs. Since none of the configuration programs is configured for online updates, no action has to be taken.

④ **Check change flag and acknowledge flag, process changes**
When the other configuration program saves its own database, it will check whether changes have been done on the MXChange server. When the change flag and the acknowledge flag for a specific tag have been set, the configuration program will modify the tag and save its own database again to import the new changes.

⑤ **Clear change flag and acknowledge flag**
When the database has been changed, the configuration program will clear the change flag and the acknowledge flag.

Online Updates

Sequence of a program which does accept online changes:



① **Change tag**
A configuration program changes a tag and confirms the changes. The details are passed to the MXChange server.

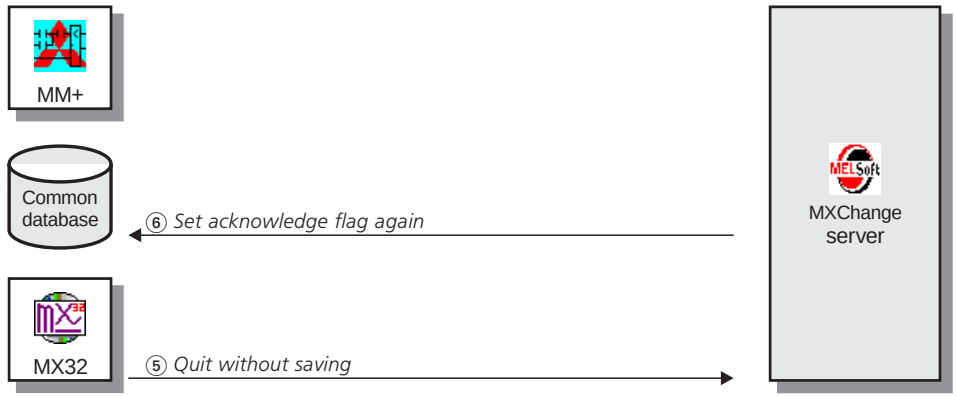
② **Set change flag and acknowledge flag**
The MXChange server sets the change flag and the acknowledge flag for all other configuration programs using the tag.

③ **Check online updates flag and notify of changes**
The MXChange server checks the online updates flag of the other configuration programs. If one of the running configuration programs is configured for online updates, it sends a message to the respective configuration program.

④ **Check change flag and acknowledge flag, process changes, clear acknowledge flag**
When receiving the message from the MXChange server, the configuration program looks for changed tags. If the configuration program finds tags which have been changed, it clears the acknowledge flag, but not the change flag. The changes cannot be saved automatically.

⑤ **Clear change flag**
When the user saves the database, the change flag is cleared.

Sequence from stage 5 if the database has not been saved:



⑤ **Quit without saving**
The user exits the program without saving.

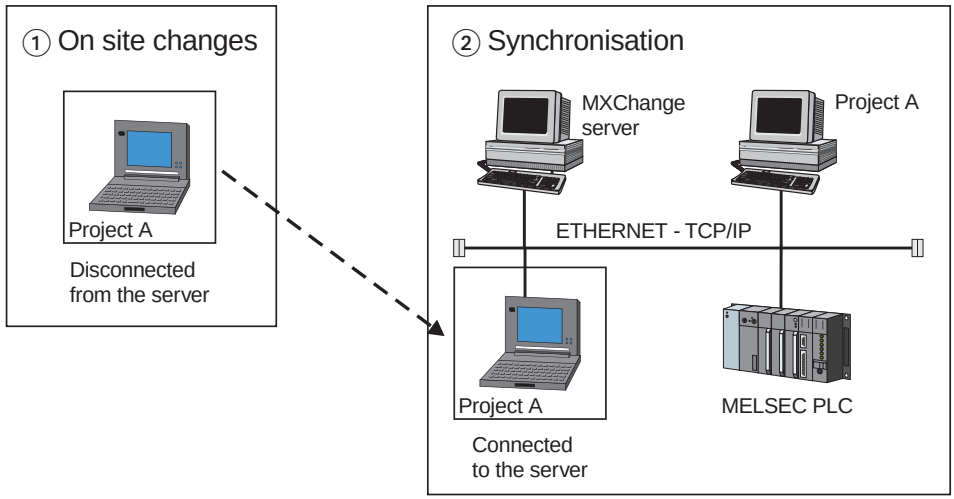
⑥ **Set acknowledge flag again**
The MXChange server notes that the configuration program has been disconnected and that the change flag has not been cleared. It sets the acknowledge flag again, so that the configuration program can try again to save the change, when it is running again.

There are separate flags for addition, deletion, and change, all used in the manner described above. The flags are processed in the following order: delete, add, change. This is important when a tag is deleted, then another tag is added with the same MXChange name before all configuration programs have deleted the respective tag.

8.2 Synchronisation mechanism of offline changes

It must be possible that programming and configuration programs change tags while the server is down. For this reason, programming and configuration programs maintain a local database of the connections between MXChange tags and their own tags. If an application tag also included in MXChange is changed, added, or deleted while the MXChange server is down, the application stores the changes locally. The calls which would have been made for the changes if the MXChange server had been up, are made when the MXChange server returns. As each application has its own way to process changes, this is a function of the according application.

This way any project can be edited offline and synchronised with the common database later.



Note: *If the MXChange server is not available, the MXChange interface Tag Editor and Super Project Manager will not run. They will terminate returning an error message. They are so reliant on the information provided by the MXChange server that there would be no benefit in running them when it is unavailable.*

A Appendix

A.1 Toolbar items

Login

Logout

New database

Open database

Save database as

Change password

Change preferences

Add node

Refresh view

New window

Cascade windows

Tile windows vertically

Tile windows horizontally

Context sensitive help

About box

A.2 MXChange interface error messages

Error Code	Meaning	Description	Causes	Actions
INT 0010	No failure code; indicates that more data is available	More data is available from the last operation.	This message should not appear - it should be processed internally by the calling application.	If the problem persists, contact the application vendor.
INT 0020	The operation has not finished	The MXChange server has not yet responded to the client.	This message should not appear; it should be processed internally by the application.	If the problem persists, contact the application vendor.
INT 0030	The action cannot be performed because one or more objects are locked by another entity	An object could not be accessed because it is in use and "locked" by another application.	Another application or Super Project Manager is using the object.	Find which application is using the object, then try again later.
INT 0040	General failure	A general failure occurred	This error often occurs when the system is severely low in memory. There could be an internal error in the calling program.	Make sure that the system has enough free memory to perform the operation. If the problem persists, contact the application vendor.
INT 0050	An attempt was made to add an item which already exists	It was not possible to add an item because another item exists with the same name.	This could occur when an attempt is made to add a tag to the system with the same name as an existing tag.	Change the name of the object which was being added and try again.
INT 0060	An object cannot be removed because there are other references to it in the system, or its child nodes must be removed first.	An attempt was made to delete an item on which other items depend	There could have been an attempt to remove a parent node whose child nodes still exist or an attempt to remove a device which is needed by other I/O references.	Look for any items which are dependent on the deleted item, and remove them first.
INT 0070	The requested object does not exist	The system could not find the object referred to.	The object might not exist or might have been deleted elsewhere.	Ensure that the object still exists, and that it is being referred to by the correct name.
INT 0080	An object name is too long or contains invalid characters	A name supplied was not acceptable regarding object naming conventions.	The name could be too long or could contain invalid characters.	Try again with a shorter, simpler name.

Error Code	Meaning	Description	Causes	Actions
INT 0090	One or more parameters is/are outside the legal range	One or more parameters had an unacceptable value.	There might be an impossible value or the value might not fit with the details of another configuration part.	Check that the value is within limits and does not conflict with other system parts, then try again.
INT 0095	The server has no current database.	The database used by the server was closed and another one has not been opened.	The database was closed, probably from the Super Project Manager menu.	Use Super Project Manager to open another database file, then try again.
INT 0100	Not logged in, or insufficient rights to perform the action	An attempt was made to perform an action which requires rights the current user does not have.	Either no user is logged in or the current user does not have a high enough access level.	Make sure that you are logged in. If you are, try logging in as a higher-level user and try again.
INT 0110	User cancelled operation	The operation was cancelled.	The operation was taking too long and was cancelled.	None
INT 0120	The call failed because it timed out.	The call was abandoned because there was no response from the server within a reasonable time.	The connection to the server has been lost due to network failure. The server is no longer running. The link to the server is slow, and responses are arriving too late.	Make sure that the network link is working. Make sure that the server is still running. Increase the server timeout settings in the registry or INI file.
INT 0130	The call failed because the link is down.	The link to the server was lost.	The connection to the server has been lost due to network failure. The server is no longer running.	Make sure that the network link is working and that the server is still running.
INT 0250	Service no. mismatch	The type of request sent to the server does not match the response type received.	This could be due to a network error or an application error.	If the problem persists, contact the application vendor.
INT 0251	Call type changed	The call type was changed between the request sent to the server and the response.	This is an internal error.	If the problem persists, contact the application vendor.
INT 0252	Synchronous request not complete	A synchronous request had not completed	This is an internal error.	If the problem persists, contact the application vendor.

Error Code	Meaning	Description	Causes	Actions
INT 0253	Unknown serial number	A request is missing	This is an internal error.	If the problem persists, contact the application vendor.
INT 0254	Synchronous / no buffer / no serial	A synchronous call was made without enough space for the results and serial number.	This is an internal error.	If the problem persists, contact the application vendor.
INT 0255	Failed to allocate request	It was not possible to allocate a request	The system is probably low in memory.	Check whether enough memory is available.
INT 0256	Asynchronous call without serial number	An asynchronous call was made without serial number	This is an internal error.	If the problem persists, contact the application vendor.
INT 0257	Cancel for unidentified request	An attempt was made to cancel an unidentified request.	This error should not appear. It could be that the request had already been cancelled.	None
INT 0258	Problem freeing request	It was not possible to free a request which had completed.	This is an internal error due to low memory.	If the problem persists, contact the application vendor.
INT 0259	Bad call type	An invalid call type was passed to the MXChange API	This is an internal error.	If the problem persists, contact the application vendor.
INT 0260	Failed to allocate buffer	It was not possible to allocate the required buffer.	The system is probably low in memory.	Free some memory, then try the action again.
INT 0261	Unexpected buffer allocation	A buffer was allocated although it was not expected.	This is an internal error.	If the problem persists, contact the application vendor.
INT 0262	Wrong buffer size allocated	The wrong buffer size was allocated.	This is an internal error which should not occur.	If the problem persists, contact the application vendor.
INT 0263	Data unexpectedly returned	More data than expected was returned from a request .	This could be a network problem or an internal error.	If the problem persists, contact the application vendor.
INT 0264	The wrong amount of data was returned.	The wrong amount of data was returned from a request.	This could be a network problem or an internal error.	If the problem persists, contact the application vendor.

Error Code	Meaning	Description	Causes	Actions
INT 0265	Data missing	Data was required but no answer was returned.	This is probably an internal error.	If the problem persists, contact the application vendor.
INT 0266	Buffer size but no pointer	A buffer size for returned data was provided, but without pointer for the data.	This is an internal error.	If the problem persists, contact the application vendor.
INT 0267	No data provided	No data was passed to an API call where it was required.	This is an internal error.	If the problem persists, contact the application vendor.
INT 0268	Null or empty nodes list	A function which needed a list of nodes was not passed.	This is a problem concerning the calling application.	If the problem persists, contact the application vendor.
INT 0269	Blank server or project name	An attempt was made to connect to a server without server or project details.	This is a problem concerning the calling application.	If the problem persists, contact the application vendor.
INT 0270	Invalid specific data size	An invalid size was provided for class specific data.	This is a problem concerning the calling application.	If the problem persists, contact the application vendor.
INT 0271	A required parameter was blank	An API call without required parameter was made.	This is a problem concerning the calling application.	If the problem persists, contact the application vendor.
INT 0272	Failed to start Tag Editor	It was not possible to start the Tag Editor.	A required file (e.g. TagEdit.dll or Tag16.exe) is missing or not in the path. There might be not enough memory to start the program.	Make sure that the required files are installed and that they are in the path. Free some memory and try again.

A.3 Server error messages

Error Code	Meaning	Description	Causes	Actions
SVR 1000	Blank project name	A connection could not be established because no project name was specified.	An attempt was made to connect a project (MM+, MX32 etc.) to the MXChange server without specifying the project name.	Make sure that a valid project is available in the calling application. If the problem persists, contact the application vendor.
SVR 1001	Project name ... was not found	A connection could not be established because the project name was not found in the database.	An attempt was made to connect a project (MM+, MX32 etc.) to the MXChange server but the specified project name was not found.	The project name might be spelt wrongly, or it does not exist on this server.
SVR 1002	PLC node ID was not found	A list of references to an MXChange tag could not be constructed, because there was no associated PLC reference.	While getting a list of projects, which use a specified MXChange tag, the PLC could not be read.	This could be due to a problem with the database configuration. If the problem persists, contact the application vendor.
SVR 1003	Parent node ID was not found	A list of references to an MXChange tag could not be constructed, because its parent node could not be found in the database hierarchy.	While getting a list of projects, which use a specified MXChange tag, the parent tag could not be read.	This might be caused by a problem concerning the database configuration. If the problem persists, contact the application vendor.
SVR 1004	MXChange tag name was not found	An operation on an MXChange tag could not be completed, because the tag could not be found in the database.	The specified MXChange tag could not be found in the database.	The tag name might be spelt wrongly or it does not exist.
SVR 1005	Not all nodes found	Only part of the requested data (for projects relating to an MXChange tag) could be found in the database.	A list of nodes was requested, but only part could be found.	If the problem persists, contact the application vendor.

Error Code	Meaning	Description	Causes	Actions
SVR 1006	First node does not exist	A list of hierarchical information was retreived from the database, but the first item is invalid or has been deleted.	The item to fetch has been deleted or does not exist.	Try the operation again. If the problem persists, contact the application vendor.
SVR 1007	Database query failed	A request for infomation from the database subsystem has failed.	The server tried to fetch data from the database, but it failed.	This could be caused by an error in the data passed to the server. If the problem persists, contact the application vendor.
SVR 1008	Parent node ID ... was not found	The parent node of this node could not be found in the database hierarchy.	The position where the node should be added cannot be found.	Ensure that the position where the item should be added exists. Try the operation again.
SVR 1009	Absolute level of parent ... does not match level of this node ...	The node could not be added to the database because the requested level is not compatible with the parent.	When adding a node, the absolute level does not match the level of the parent node (e.g. the absolute level is two levels below the level of the parent node).	Supply the correct level. Try the operation again.
SVR 1010	Insufficient access level to add nodes of class ...	You do not have the correct access level to add this information class.	The following causes are possible: - You are not logged in. - You have to log in at a higher access level to add this node class. - It is not possible to add this node class.	Log in (at a higher access level if necessary). Try the operation again.
SVR 1011	Unable to create node ..., parent ID ...	The database entry could not be created.	Each database node stores extra information dependent on its type. The amount of data supplied did not match the amount expected for the type of node.	If the problem persists, contact the application vendor.
SVR 1012	Node ID ... was not found	The given node identifier could not be found in the database.	The node ID can be incorrect or the node can have been deleted.	Ensure that the node ID still exists in the database.
SVR 1013	Insufficient access level to modify node ... of class ...	The user does not have the correct access level to modify information of this class.	The following causes are possible: - You are not logged in. - You have to log in at a higher access level to add this node class. - It is not possible to modify this node class.	Log in (at a higher access level if necessary) and try the operation again.

Error Code	Meaning	Description	Causes	Actions
SVR 1014	The data size for class ... is incorrect (expected ..., got ...)	The operation could not be completed, because the data size does not match the size expected for this information type.	Each node in the database stores a certain amount of data. While trying to modify a node, the incorrect amount of data was supplied.	This might be caused by a problem concerning the calling application. If the problem persists, contact the application vendor.
SVR 1015	No node to delete	The delete operation failed or the node to be deleted could not be found.	The node to be deleted does not exist.	Ensure that the node to be deleted is in the database.
SVR 1016	Field name ... not found	A value could not be written in a database field, because the field does not exist.	The field does not exist. The wrong node has been used. Another node has been passed which does not include the required field.	Ensure that the node exists and that it has the required field.
SVR 1017	Missing or non-alphabetical first character of MXChange tag name ...	An incorrect MXChange tag name was supplied.	No MXChange tag name has been specified. The first character in the name is not alphabetical.	Ensure that the first character is valid.
SVR 1018	Invalid character ... at position ... in MXChange tag name ...	The MXChange tag name is not valid because it includes an illegal character.	Only alphanumeric characters are allowed in MXChange tag names.	Change the invalid character and try the operation again.
SVR 1019	No device node found	A database entry matching the specified device node could not be found.	The server could not find an MX32 device driver for the tag to be added. This could be because no driver is configured to communicate with the PLC. It was not possible to find the ProfiMap slave where this tag should be added.	Ensure that a suitable slave/device is defined and selected. Try the operation again.
SVR 1020	No matching PLC found	The PLC referenced by the MXChange tag has no corresponding entry in the database.	While trying to add an MXChange tag to the database, it was not possible to find the PLC.	Ensure that the PLC is defined and specified correctly. Try the operation again.
SVR 1021	No PLC ID found	A valid reference to the specified PLC database entry could not be found.	While trying to add a tag to the database, it was not possible to identify the PLC holding the I/O reference.	Ensure that the details supplied define the PLC holding the I/O reference.

Error Code	Meaning	Description	Causes	Actions
SVR 1022	Multiple tags found	An MXChange tag could not be added to the database because one with the same identity already exists.	The following causes are possible: - A node is added to the hierarchy with a name already existing. - The maximum number of that node type already exists, e.g. each MX project can only have one driver node of each type. - There are already more than one tag including the same details (internal error). - The MXChange tag to be added already existed on the specified device.	Try to add the node with a different name. Ensure that there are not too many nodes of the specified type. Check whether the tag exists only once. Check whether the tag does not already exist on the MX device.
SVR 1023	Parent node ... is incorrect	An MXChange tag could not be added to the database because its parent has the wrong type.	The MXChange tag type cannot be added to the specified parent node.	Ensure that the node was added at a valid position. If the problem persists, contact the application vendor.
SVR 1024	Level has changed several times	The MXChange tag could not be added because its specified position is incorrect.	While adding an MXChange tag, the level to add changed several times. By this it was impossible to find the position where the MXChange tag should be added.	This problem concerns the calling application. If the problem persists, contact the application vendor.
SVR 1025	The child node has no parent node	The MXChange tag could not be added, because no parent node was specified.	An attempt was made to add an MXChange tag under another MXChange tag without specifying the parent tag.	This problem concerns the calling application. If the problem persists, contact the application vendor.
SVR 1026	Missing project ID ...	The project could not be found.	The project does not exist or it has been deleted.	Ensure that all the projects exist. Try the operation again.
SVR 1027	No child nodes found	The node in the database hierarchy should have child nodes but it has not any.	An attempt was made to add a child MM+ tag without specifying the parent node. An MM+ project does not have a local I/O node.	Ensure that the parent node is specified correctly. Check whether the MM+ project has a local I/O node (and add one if necessary).

Error Code	Meaning	Description	Causes	Actions
SVR 1028	Unable to add node to database	The node could not be added to the database.	There will be a secondary error message giving more details.	Look at the secondary error messages to determine the action to take.
SVR 1029	Missing DP parent	The specified DP parent does not exist in the database.	While adding a ProfiMap DP tag, it was not possible to find the specified parent tag. While adding ProfiMap DP tags based on level, no parent could be found for the specified level.	Check whether a valid parent node is specified. Try the operation again.
SVR 1030	DP node level does not match level supplied from DP parent	The entry cannot be added to the database, because its DP parent has the wrong level.	When adding a ProfiMap DP node and specifying the parent node directly, the level of the specified parent node does not match the tag level.	Check whether the level and parent nodes are valid. Try the operation again.
SVR 1031	Level has jumped forward while trying to add DP node	No parent was specified, but the current level is incorrect.	While adding a number of DP tags based on level, a level has been left out.	Check whether each tag is only one level deeper than the previous tag.
SVR 1032	Cannot add because no ProfiMap slave exists with range containing ...	The MXChange tag cannot be added to the database, because the specified I/O range is not within the range of an existing slave.	The address is incorrect or a new slave must be added.	Correct the address or add another slave.
SVR 1033	The slave specified does not match the calculated slave for new ProfiMap DP tag	The slave calculated from the parent or level does not match the specified slave .	The ProfiMap slave was specified and also calculated from the details supplied (address etc.). But the specified slave and the calculated slave do not match.	Check whether the supplied slave is suitable. If necessary, try to add the tag without specifying a slave. By this the server can calculate the most suitable slave automatically.
SVR 1034	Missing I/O node under DP slave ...	The tag cannot be added because no local I/O information was found under the DP slave.	The local I/O node was not added or has been deleted.	Add a local I/O node under the ProfiMap DP slave using Super Project Manager.
SVR 1035	Missing FMS parent	The specified FMS parent is missing.	The specified FMS parent does not exist.	Correct the parent details. Try the operation again.

Error Code	Meaning	Description	Causes	Actions
SVR 1036	FMS node level does not match level supplied from parent	The supplied FMS node level does not match the level from the parent.	An FMS parent tag and the corresponding FMS node level were specified. The level is incompatible with the level of the parent FMS node.	Correct the parent node or the level. Try the operation again.
SVR 1037	Level has jumped forward while trying to add FMS node	No parent was specified, but the current level is incorrect.	While adding several ProfiMap FMS tags, the depth of a tag increased by more than one. By this it became impossible to assign a parent node.	Check whether each tag is only one level deeper than the previous tag.
SVR 1038	No matching slave name for FMS tags	No appropriate slave name was found for FMS tag.	While adding a ProfiMap FMS tag, a slave was specified. This slave could not be found.	Ensure that the name is spelt correctly and that the slave exists.
SVR 1039	Missing MP+ I/O card	The tag cannot be added because no appropriate PLC connection was found.	While trying to add a tag to an MP+ project, it was not possible to find a communications card connecting the project with the required PLC.	Define a communications card connecting the project with the PLC where the data is stored.
SVR 1040	Bad MX driver or device (no link to PLC found)	Bad MX driver or device. No link was found to the PLC.	When adding tags to an MX project, the server has to detect which MX device driver and channel is used to connect to the PLC where the data is stored. It was not possible to find a link to the specified PLC.	Ensure that the MX driver, device, and channel are configured for the link to the PLC containing the I/O reference.
SVR 1041	No MX driver or device available	There are no MX drivers available.	There are no MX drivers for the MX project or there are no devices appropriate for this I/O reference.	Ensure that the MX driver, device, and channel are configured for the link to the PLC containing the I/O reference.
SVR 1042	Unknown project type	A database entry was found for an unknown project type.	An attempt was made to add an MXChange tag to a project type which is not known to the server. This can be caused by a different version of server and database.	Ensure that the server and database versions match.
SVR 1043	Not implemented in this version	The functionality is not implemented in this software version.	An unsupported function was called. The application uses a newer client software version than the server.	Ensure that the server and client versions match.
SVR 1044	No database records found	The search for the specified data returned no information.	This is not always an error. It could mean that a valid query was made which returned no data.	If an operation is persistently failing due to this error, contact the application vendor.

Error Code	Meaning	Description	Causes	Actions
SVR 1045	Failed to find database key	The field name was not found in the database.	An attempt was made to read or write a miscellaneous long binary field which could not be found.	Check whether the database version is valid. If the problem persists, contact the application vendor.
SVR 1046	Table or field not found in database	Failed to locate the table or field in the database.	An attempt was made to read or write a miscellaneous long binary field, but the table or the field does not exist.	Check whether the database version is valid. If the problem persists, contact the application vendor.
SVR 1047	Node not found	The requested node was not found in the database.	The database might have been changed since the node was last referenced or this could be an internal error.	Check whether the node still exists. Try the operation again.
SVR 1048	Cannot delete module ... from non-modular slave	The database item cannot be deleted, because the parent is not a modular slave.	A single "module" is defined for non-modular slaves to specify the number of inputs and outputs. It cannot be deleted.	None
SVR 1049	Insufficient access level to delete nodes of class ...	You do not have the correct access level to delete this node class.	The following causes are possible: - You are not logged in. - You have to log in at a higher access level to delete this node class. - It is not possible to delete this node class.	Log in (at a higher access level if necessary). Try the operation again.
SVR 1050	A node called ... already exists	There is already a database entry with the same name at the current level.	An attempt was made to add a node with a name already existing.	Rename the item or delete the existing item.
SVR 1051	Only an MX project can modify the MX node name ...	The MX node name can be modified only by an MX project.	MX tags cannot be renamed. They must be deleted and then added again. MX tags are renamed only if they have been added from elsewhere and the name suggested collides with the name of an existing tag. In this case, the MX interface assigns a new name for the MX tags automatically.	To rename the MX tag, delete it. Then add it again with the new name.
SVR 1052	Some required fields for class ... were left blank	Some fields required for this database type were left blank.	A new node was written to the database but part of the necessary information is missing.	Ensure that the necessary information was supplied. Try the operation again.
SVR 1053	Node ... is locked by user ..., project ...	Another project is currently accessing this database item.	An attempt was made to modify or delete a node which someone else is currently using.	Wait until the other user has finished. Try the operation again.

Error Code	Meaning	Description	Causes	Actions
SVR 1054	Cannot add node because it is not an MXChange tag	A routine to add an MXChange tag to the database was called for non-MXChange tag.	This is an internal error.	If the problem persists, contact the application vendor.
SVR 1055	Child nodes must be deleted before parent node "..."	An attempt was made to delete a parent database entry before deleting the child nodes.	Some node types cannot be deleted until all items below them have been deleted.	Delete the child nodes before deleting this parent node.
SVR 1056	Unexpected or unknown class ID ...	An attempt was made to delete an unknown MXChange tag type.	The application uses a newer client software version than the server.	Ensure that the software versions match.
SVR 1057	Cannot find class ID field in record (or unexpected format)	The class ID cannot be found in the database record.	When deleting an MXChange tag, an invalid class ID was found. This is an internal error.	If the problem persists, contact the application vendor.
SVR 1058	Not allowed to change ID, level, or parent	Not allowed to change ID, level, or parent.	An attempt was made to modify the ID, level, or parent of a node. This is not permitted.	If any of the above details need to be modified, the node must be deleted and then added again.
SVR 1059	Not permitted change of MXChange tag address	An invalid change has been made to the MXChange tag properties.	An attempt was made to change a tag's address in a not permitted way (e.g. changing the PLC where the I/O is stored).	If the change is necessary, delete the tag and then add it again.
SVR 1060	Missing project specific node for MXChange tag	Cannot find the project specific entry for this MXChange tag.	It was not possible to find one of the project specific nodes for this MXChange tag. This can be caused by a problem concerning the database or an internal error.	If the problem persists, contact the application vendor.
SVR 1061	MM+ range mismatch (limit ..., got ...)	The end address specified in the MM+ tag is higher than the end address specified in the MXChange tag.	This can happen when the size of a project specific tag is changed, but the size of the MM+ tag related to it is not changed.	Check whether the modified tag is compatible with the MXChange tag.
SVR 1062	MX tag range mismatch (limit ..., got ...)	The end address specified in the MX tag is higher than the end address specified in the MXChange tag.	An attempt was made to modify an MX tag in a way incompatible with the matching MXChange tag.	Ensure that the MX tag remains valid after it has been modified. If necessary, delete the tag and add it again.

Error Code	Meaning	Description	Causes	Actions
SVR 1063	MP+ tag range mismatch (limit ..., got ...)	The end address specified in the MP+ tag is higher than the end address specified in the MXChange tag.	An attempt was made to modify an MP+ tag in a way incompatible with the matching MXChange tag.	Ensure that the MP+ tag remains valid after it has been modified. If necessary, delete the tag and add it again.
SVR 1064	No MXChange tag found corresponding to MX tag	No MXChange tag corresponding to an MX tag exists in the database.	The MXChange tag has been deleted in a way which left the MX tag "orphaned".	Delete the MX tag and add it again.
SVR 1065	No MXChange tag found corresponding to MM+ tag	No MXChange tag corresponding to an MM+ tag exists in the database.	The MXChange tag has been deleted in a way which left the MM+ tag "orphaned".	Delete the MM+ tag and add it again.
SVR 1066	No MXChange tag found corresponding to MP+ tag	No MXChange tag corresponding to an MP+ tag exists in the database.	The MXChange tag has been deleted in a way which left the MP+ tag "orphaned".	Delete the MP+ tag and add it again.
SVR 1067	Cannot change MP+ I/O card's address if there are I/O references	Cannot change MP+ I/O card's PLC address if there are I/O references.	An attempt was made to change the details of an MP+ I/O card, but there are tags assigned to the card. The change cannot be allowed, as it could invalidate the tags.	None
SVR 1068	Invalid change to DP slave node	DP slave node change to device, ID, range, or type is invalid.	A change was made to the type, the base PLC, the input device, or the output device of a DP slave node. These changes are not permitted.	None
SVR 1069	Not allowed to change inputs/outputs on a DP non-modular slave	Not allowed to change inputs/outputs on a DP non-modular slave.	A DP non-modular slave is defined with a "module" node to define the number of inputs and outputs. These values cannot be changed after the slave has been defined.	None
SVR 1070	Bad change to DP I/O reference	Can only modify DP input or output references.	A DP I/O reference of an unknown type was encountered. This can be caused by a problem concerning the database or an internal error.	Check the tag details via the Super Project Manager.
SVR 1071	Cannot modify module node of a non-modular slave	An attempt was made to modify a module node of a non-modular slave.	Non-modular slaves are defined with a single "module" node to hold details of their inputs and outputs. This node cannot be modified.	None
SVR 1072	Unknown flag type	An attempt was made to modify a database entry using an unknown flag type (i.e. not add, modify, or delete).	This is an internal error.	If the problem persists, contact the application vendor.

Error Code	Meaning	Description	Causes	Actions
SVR 1073	The child node is not the correct type	This type of database entry is incompatible with the parent node type.	An attempt was made to add a node not permitted as a child node of the specified parent node (e.g. add an MX driver node at the top level of the hierarchy).	None
SVR 1074	Allocate GSD class; problem concerning GSD database	While preparing to include a new GSD slave or module, it was not possible to examine the GSD database.	The following causes are possible: - There is no GSD database node in the database. - The GSD database node does not contain a valid GSD database. - There was not enough space in the temporary directory to extract the GSD database. - There is not enough free memory to hold a copy of the GSD database.	Check whether the GSD database node exists. Make sure that the GSD database node contains a valid database. Ensure that there is free space on the drive. Free memory to hold a copy of the GSD database.
SVR 1075	Allocate GSD class; no matching slave or module entry in GSD database	The GSD database does not contain a matching entry for the slave or module to be allocated.	An attempt was made to add a GSD slave or module to the system, but it does not exist in the GSD database.	Add the slave or module to the GSD database. Try the operation again.
SVR 1076	Allocate GSD class; slave does not support DP	The slave to be added does not support DP.	An attempt was made to add a GSD slave to the system, but it does not support the DP standard.	None
SVR 1077	Allocate GSD class; module to allocate has no matching slave	There is no slave allocated for the module to allocate.	An attempt was made to add a GSD module to the system, but the matching slave has not yet been added.	Add the slave before attempting to add its modules.
SVR 1078	Allocate GSD class; failed to allocate a new class	It was not possible to allocate a new class for a DP slave or module.	The maximum number of DP slaves has been exceeded or the maximum number of modules per DP slave has been exceeded.	Check whether the number of devices assigned is below the maximum number. If necessary, delete any unused DP devices. Try the operation again.
SVR 1079	Allocate GSD class; cannot free a class in use	It was not possible to free a DP slave or module class, because they are in use.	The DP slave or module type itself is in use or a module is in use and an attempt was made to delete the slave.	Remove all DP slaves and modules of this type before trying the operation again.
SVR 1080	Database "..." does not have read and write access	It was not possible to use the specified database, because it is not readable or not writeable.	The file might be read only or it is not accessible to the user running the server (NT only).	Make sure that the database file is accessible and not read only.

Error Code	Meaning	Description	Causes	Actions
SVR 1081	No database to "save as"	An attempt was made to use "Save as" without current database.	No database is opened, so it cannot be saved with a new name.	Open the database and try the operation again.
SVR 1082	Cannot add item to PLC because maximum number of this type (...) would be exceeded	An attempt was made to add an item to a PLC which the item does not support or already has the maximum number of items of that type.	The PLC does not support this item type (maximum number 0), e.g. it does not support DP cards. The PLC already has the maximum number of that items, e.g. it might be limited to two Ethernet cards and unable to support a third.	If the maxmimum number of items of that type has been reached, it might be possible to delete one of the existing items.
SVR 1083	Not permitted to change PLC type	It is forbidden to change the PLC project type after it has been created.	An attempt was made to change the PLC type. This is not permitted except in MM+.	The PLC type can be changed only by removing the project and recreating it or by using MM+ to change the type.
SVR 1084	Invalid PLC address	An invalid PLC address was encountered.	An attempt was made to use an invalid PLC address. The device type does not exist or the specified address does not exist for the device type.	Ensure that the address is valid for the PLC. Different PLC types have different address ranges.
SVR 1085	Licencing limits exceeded	An action was tried exceeding the limits of your software licence.	The number of MXChange tags which can be added has exceeded the licencing limits.	If you need to add more MXChange tags than the licence permits, contact your distributor.
SVR 1086	Server with duplicate serial number found at address ... - terminating!	The server is terminating, because another server was found with the same serial number.	Each server licence allows one instance of the server to run on a single computer.	If you need to run another server, contact your distributor.
SVR 1087	This project is already open by user '...'	This project has already been opened by another user.	Most projects can be used by only one person at a time. Someone else is already using this project.	Wait until the current user has finished before trying to open the project again.

Error Code	Meaning	Description	Causes	Actions
SVR 1088	Unsupported MX block type '...'	The requested MX block type is not supported by MX32.	MX32 supports blocks with only one base I/O address, which can have addresses in Mitsubishi PLCs.	Use a supported block type: AI, AO, AR, DI, DO, DR, AA, DA, AIL, AIM, AIS, AOL, AOM, AOS, DIL, DIM, DIS, DOL, DOM, DOS, DFL, DFM, DFS, DXL, DXM, DXS, TX.
SVR 1089	Not licenced to use this version	The installed server licence is for an earlier version of MXChange.	Although service releases of the same version can be installed, running a newer version of MXChange will require a licence upgrade.	Contact your distributor to purchase an upgrade.
SVR 1090	Current computer is not authorised	The MXChange server is locked to one computer. The current computer has not been authorised for using MXChange.	After a licence has been installed (from disk), an authorisation code must be entered to lock the software to the current PC.	Contact your distributor for an authorisation code.
SVR 1091	Trying to reuse an MXChange tag with different details	An attempt was made to reuse an MXChange tag, but the details did not match.	Either the I/O device (e.g. D, M, X, Y) or the starting I/O address was different.	Either add the tag with the same details or create a new tag.
SVR 1092	No corresponding MXChange tag to DP tag found	No MXChange tag corresponding to a ProfiMap DP tag exists in the database.	The MXChange tag must have been deleted in a way which left the ProfiMap DP tag 'orphaned'.	Delete the ProfiMap DP tag and add it again.
SVR 1093	An unhandled exception occurred during processing	An unforeseen problem occured while dealing with a request.	The parameters could be incorrect.	Retry the request, making sure that the parameters are correct.
SVR 1094	User not found	The user name is not known.	The user name was typed incorrectly or there is no such user name for this database.	Ensure that the name was typed correctly. If it was, the user name is not valid for this database.
SVR 1095	Cannot add I/O references with this API call	It is not possible to add I/O references with certain API calls.	This would normally occur if an application tried to use AddNodes() to add I/O references.	Contact the application vendor if the problem persists.

Error Code	Meaning	Description	Causes	Actions
SVR 1096	Cannot perform file operation because other users are connected	An attempt was made to change the database (open/close/new) while other users were still connected to it.	It is not possible to select another database unless you are the only user connected.	Make sure that all other users have disconnected from the database and then try again.
SVR 1097	The database specified is already connected to another server	An attempt was made to connect the server to a database that is already connected to another server instance.	It is not possible for more than one server instance to be connected to the same database.	Access the server instance that is already connected to the database required.
SVR 1098	Failed to parse import file at line ...	An incorrect layout was encountered while parsing an import file. The error occurred at the line shown (the first line is numbered as one).	The export file version might not be supported (if the error occurs on the header line).	Only use export files suitable for the current version. If you have generated the file yourself, copy the header from an automatically produced export file.
			The file layout could be incorrect.	Examine the file to check the layout. If you have edited the file yourself, check that it matches the layout of an automatically produced export file, including the header.
			A tag could have an invalid address.	Make sure that the address of the tag on the offending line is valid by entering it directly in Super project manager.
			There might not be enough fields on the line.	Make sure that the line has enough fields - the first three fields must always be provided for a tag, although other fields can be left as default values.

Error Code	Meaning	Description	Causes	Actions
SVR 1099	No tags found in import file	An attempt was made to import a file which contained no tags.	The file did not contain any tags.	Examine the file with notepad to confirm that the contents are correct.
SVR 1100	Element size of type '...' should be ...	An attempt was made to set the size of a data type to an incorrect value.	The size does not match the normal size of the type, e.g. an integer is two bytes.	Change the size to match - the expected size is shown in the error message.
			The size of a STRING was set to 0.	Change the size of the STRING to 1 or more.
SVR 1101	Tag has unknown data type	An attempt was made to set or change the data type of a tag to an unknown value.	The type of a tag was changed to one which is not known to MXChange.	Use of of the data types available in Super project manager.

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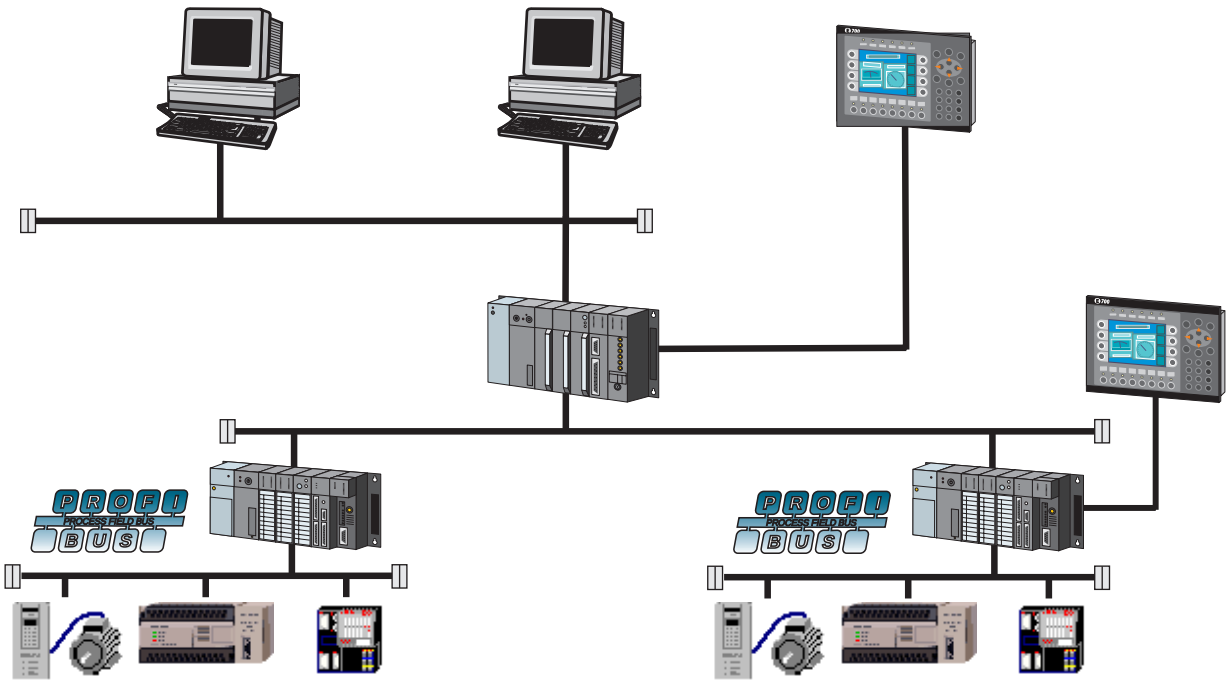

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