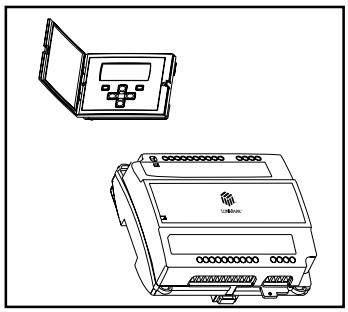

TAC Xenta®

and LonMaker® Release 3

0-004-7775-1 (GB), 2001-02-15

Forword

Welcome to the manual of TAC Xenta and LonMaker® release 3.

Should you discover errors and/or unclear descriptions in this manual, please contact your TAC representative.
You may also want to send an e-mail to **helpdesk@tac.se**.

This manual describes the recommended method of procedure when designing LonWorks® networks, based on TAC Xenta controllers (from version 3.2), using Echelon®'s binding tool "LonMaker Release 3", often abbreviated LM3.

This edition, -1, uses version 3.0 of this tool, described in the "*LonMaker User's Guide, Release 3*", published by Echelon Co., USA, part no. 078-0168-02D.

The manual assumes that the reader is familiar with the products and their use.

The page numbering is continuous in stead of chapter-based.

List of Revisions

Part no.	Comments	Writer	Date
0-004-7775-0	Original preliminary release.	KW	2000-03-10
0-004-7775-1	Revised due to LonMaker v 3.0.	KW	2001-02-15

TAC Xenta
and LonMaker Release 3

Subject to modification.

Contents

This manual contains in all 88 pages.

1 Introduction

1.1 Purpose

This manual intends to show how to use Echelon® Corporation's network management tool *LonMaker Integration Tool Release 3* ("LM3"), when working with TAC Xenta components in a LONWORKS network.

LM3 runs as an application on the LNS™ (LONWORKS Network Services) network operating system. LNS is a client-server system with all the functions that are needed to handle an open LONWORKS network.

The manual is intended to be a complement to Echelon's *LonMaker for Windows User's Guide* (please refer to section 1.3 below). Our manual describes primarily procedures recommended by TAC and facts that should be known when installing TAC Xenta products.

For LonMaker standard procedures we will in the succeeding chapters refer to the corresponding information in Echelon's manual.

We build on a specific example and will show how this is implemented, from the initial system considerations, via network configuration to the commissioning and certain types of maintenance.

A basic idea is to use, as much as possible, "Templates" in LM3 to decrease the amount of data that has to be manually entered. This applies primarily to the controllers in the TAC Xenta 100 series and to the I/O modules in the TAC Xenta 400 series.

1.2 Scope and restrictions

The descriptions in this manual are valid for the following products and releases.

- **TAC Xenta 100 v 1.10**
- **TAC Xenta 301** and **302 v 3.2, hardware type 2**
- **TAC Xenta 401 v 3.2**
- **TAC Xenta OP v 3.0** or later
- **TAC Xenta 41x I/O modules v 1.02-04**
- **TAC Xenta 42x I/O modules v 1.02-04**

- **TAC Xenta 45x I/O modules v 1.02-04**
- **TAC Xenta 471 I/O modules v 1.00-04**
- **TAC Xenta 49x I/O modules v 1.00-02**
- **TAC Xenta 511 Web Server for LonWorks network**
- **TAC Xenta 901 Serial LonTalk adapter**
- **TAC Menta v 3.24**
- **TAC Vista v 3.1**
- LonMark certified foreign zone controllers.

Unfortunately, an upgrade to LM3 of a system built with other kinds of binding tools often requires major reprogramming.

Note! LM v 2 cannot be used with Windows2000, whereas v 3 can.

1.3 More information

The **working method** follows the guidelines given in the manual:

- "TAC Xenta family v3, Engineering Guidelines", part no. 0-004-7639.

The **Integration tool** is described in the manual:

- "LonMaker User's Guide, Release 3", Echelon Co. USA, part no. 078-01628-02D.

Information is also obtainable from Internet: `www.echelon.com`

The **Drawing tool** Visio® Technical is described in the manual:

- "Using Visio Technical, 5.0", Visio Co. USA, part no. 11748-0897.

The **TAC Xenta 100** controllers are described in a number of data sheets and installation instructions and in the manuals for
TAC Xenta 101, part no. 0-004-7513,
TAC Xenta 102, part no. 0-004-7516,
TAC Xenta 102-ES, part no. 0-004-7663 and
TAC Xenta 103, part no. 0-004-7526.

The **TAC Xenta 400** I/O modules are described in the following documents:

- "TAC Xenta 400 I/O modules" handbook, part no. 0-004-7771.
- The data sheet for TAC Xenta 411/412 (C-92-10)
- The data sheet for TAC Xenta 421/422 (C-92-15)
- The data sheet for TAC Xenta 451/452 (C-92-20)
- The data sheet for TAC Xenta 471 (C-92-25)
- The data sheet for TAC Xenta 491/492 (C-92-30)
- a short installation instruction, "0FL", enclosed with each product

The **TAC Xenta 300 and 401** controllers and the Operator panel are described in the following documents:

- "TAC Xenta 300 and 401 Handbook", part no. 0-004-7768.
- "TAC Xenta Network guide", part no. 0-004-7460.
- The data sheet for TAC Xenta 300 (C-90-05)
- The data sheet for TAC Xenta 401 (C-92-05)
- The data sheet for TAC Xenta OP Operator panel (C-98-05)
- a short installation instruction, "0FL", enclosed with each product

TAC Xenta 901, a serial LonTalk adapter, is described in:

- "TAC Xenta 901 Handbook", part no. 0-004-7660.
- The data sheet for TAC Xenta 901 (C-96-10)

TAC Xenta 911, an IP modem replacing the telephone modem, is described in:

- The data sheet for TAC Xenta 911 (C-96-15)

TAC Xenta 511, a unit which can supervise a minor LONWORKS network or act as a local presentation system in a large network, is described in:

- The data sheet for TAC Xenta 511 (C-97-1)

Furthermore, useful instructions are presented in:

- "TAC's web products, Engineering guidelines", part no. 0-004-7790.

TAC Menta with its network configuration tool is described in

- "TAC Menta v3 User's manual", part no. 0-004-7608.
- "TAC Menta v3 Reference manual", part no. 0-004-7609.

TAC Vista and those modules which are treated in this manual are described in the following manuals.

- "TAC Vista 3.2, Operator guide", part no. 0-004-7571.
- "TAC Vista 3.21, Basic functions", part no. 0-004-7647.
- "TAC Vista 3.21, Communication LonWorks", part no. 0-004-7585.
- "TAC Vista 3.21, Database generator", part no. 0-004-7578.
- "TAC Vista 3.21, Colour graphic editor", part no. 0-004-7576.

For a description of the interface between TAC Vista and the network ('LonTalk Adapter') please refer to the corresponding product documents.

1.4 Terminology

Acronyms

LNS	LonWorks Network Services
LM3	LonMaker Tool Release 3
HMI	(sometimes MMI) HuMan-Machine Interface
FBD	Functional Block Diagram
XIF-file	eXternal Interface File
*.vsd	Visio drawing file
*.vst	Visio drawing file as template
*.vss	Visio stencil files
NCT	Network Configuration Tool (for example the TAC Menta NCT)
WebTool	Programming tool from TAC to design a supervisory/ presentation system in the TAC Xenta 511 unit.

Concepts

Bindings To be able to send a value from one unit to another on the network, you must perform a binding (hence, Binding tool). By defining one or several bindings you will establish a signal path between two or more units.

Hub – Target *Hub* is the name of that end of the signal path which is alone in sending or receiving. *Target* is the name of the opposite end(s). When sending from one unit to one other unit, these designations loose their meaning.

Program ID Each LonMark product has a *Node Identification String*, also called program ID. It consists of eight hexadecimal number-pairs and contains information about the program manufacturer, product identification, program release, status and other things. Different products carry different program-IDs, but for a specific product the IDs will differ only if they are loaded with different application programs.

Location String A text string of six characters, mainly indicating where the unit is situated or what purpose it serves. As default “Location String” TAC Xenta 300/401, with system program version 3.4 or higher, uses the last six characters of the unit name, specified in TAC Menta NCT. LM3 can use this text string in order to simplify the identification of the specific units on the network.
Example: *Floor3apt12* becomes ’*3apt12*’.

XIF-files – Device Templates Available *network variables* for the unit and its *configuration parameters* are stored in a *XIF-file* (eXternal Interface File). When this file has been imported to LM3 it is called a *Device Template*. Also the program ID of the unit is stored here. The program-ID is used by LM3 to check that the unit being installed is of the correct type and version.

The Program-ID must be unique for a specified set of network variables.

It is convenient to collect all *.XIF-files that are to be used, in a directory of their own, for example C:\LonWorks\Import\TAC.

A *Device Template* may, in LM3, be associated with a unit in three different ways;

- Uploaded from the respective units.
- Imported from a XIF-file.
- An existing Device Template is used.

In order to enter units to LM3, you must let the tool have access to the corresponding Device Templates in one of the ways described, whether you design your network on-line or off-line.

***Network Variables**: nvi, nvo* (*Network Variable Input* and *Output*) Values that are sent to (*nvi*) or out from (*nvo*) a unit. An example could be the outdoor temperature.

***Configuration parameters:** nci* (*Network Configuration variable, Input*) A number of parameters to set the behaviour of the unit; for example the P band value.

Note! Please note that *nci* often is stored in the flash memory or in EEPROM. In that case you must not let the variable be frequently written into, as these kinds of memory only stand a certain number of write procedures (for example 10 000 for one type).

Plug-in A Plug-in is usually a software specially designed for a certain type of node (associated via the Program ID of the node), to facilitate work with this node. Such a Plug-in is handled via a dialogue window with tabs (a Property Sheet dialogue), where all the parameters and variables can be reached.

Visio drawing tool Visio Technical 2000 is a program tool used by LM3 to handle and present all network drawings.
The following terms are used. (P.T.O.)

drawing
drawing file
subsystem
Visio page

A LonMaker drawing consists of

one or several drawing files (see below). Each file may include

one or several subsystems, where each subsystem makes up

one Visio page.

In the Visio manual a couple of terms also need to be explained: '*shapes*' and '*stencils*'.

shape

A *shape* is a "screen-based sticker", that is, a drawing object which can be copied onto the drawings. It may consist of a line or a rectangle, but may also have a more complex design to represent a LonMaker unit or a function block.

stencil

These *shapes* are collected in separate drawings, labelled *stencils* in Visio and are then often referred to as *master shapes*.

To use *shapes* you open the required *stencil* (command `Open Stencil`) or click on a dedicated button in the tool bar of the window, point on the requested *master shape* and draw it to its place in the drawing, getting a copy of the *shape*.

File types in Visio/LM3

The drawing files which are created when you work with Visio via LM3 are true *Visio files*. The respective file types may be identified by the following name additions;

- *.vsd Visio drawing file
- *.vst Visio drawing file as template
- *.vss Visio stencil file

Domain table

TAC Xenta was originally designed to work with two *domains*, the application domain and the zero-length domain. Using the network configuration tool of TAC Menta, NCT, you can configure the TAC Xenta 300/401 units, assigning the Xenta a subnet/node address, the same in both domains.

An LNS network uses only one domain, the application domain. Additionally, the management tool of LM3 assigns its own address values to the respective units; these assignments are completely beyond the influence of the operator.

When a TAC Xenta 300/401 unit is to be used in an LNS network, you check-mark the NCT box *Using Network Management Software*. NCT will then no longer address the TAC Xenta units; instead, this will be handled by LM3.

As, for example, the Service pin message from an I/O module is always sent on the zero-length domain, a TAC Xenta installed with LM3 cannot receive this message. Instead, you must use the TAC Menta program for network configuration (NCT) at the installation, enter the neuron-ID of the I/O module manually and mark it as "pre-configured".

TAC group All TAC units, except TAC Vista, belong to the common TAC group 51. TAC Vista can, however, communicate with the TAC group.

TAC Xenta group The TAC Xenta group is a simpleway to build a hierarchy of the Xenta units, for example when a presentation system like TAC Vista is connected to a LONWORKS net. The communication is handled by a *Group master*. The Group master has the information about which TAC Xenta units are on-line or off-line and forwards this to the presentation system. The TAC Xenta groups are also used in TAC Xenta OP. TAC Xenta groups must not span Routers.

TAC Xenta Group master TAC Xenta unit which in TAC Menta is appointed to be group master for the information exchange between the *TAC Xenta group* and TAC Vista.

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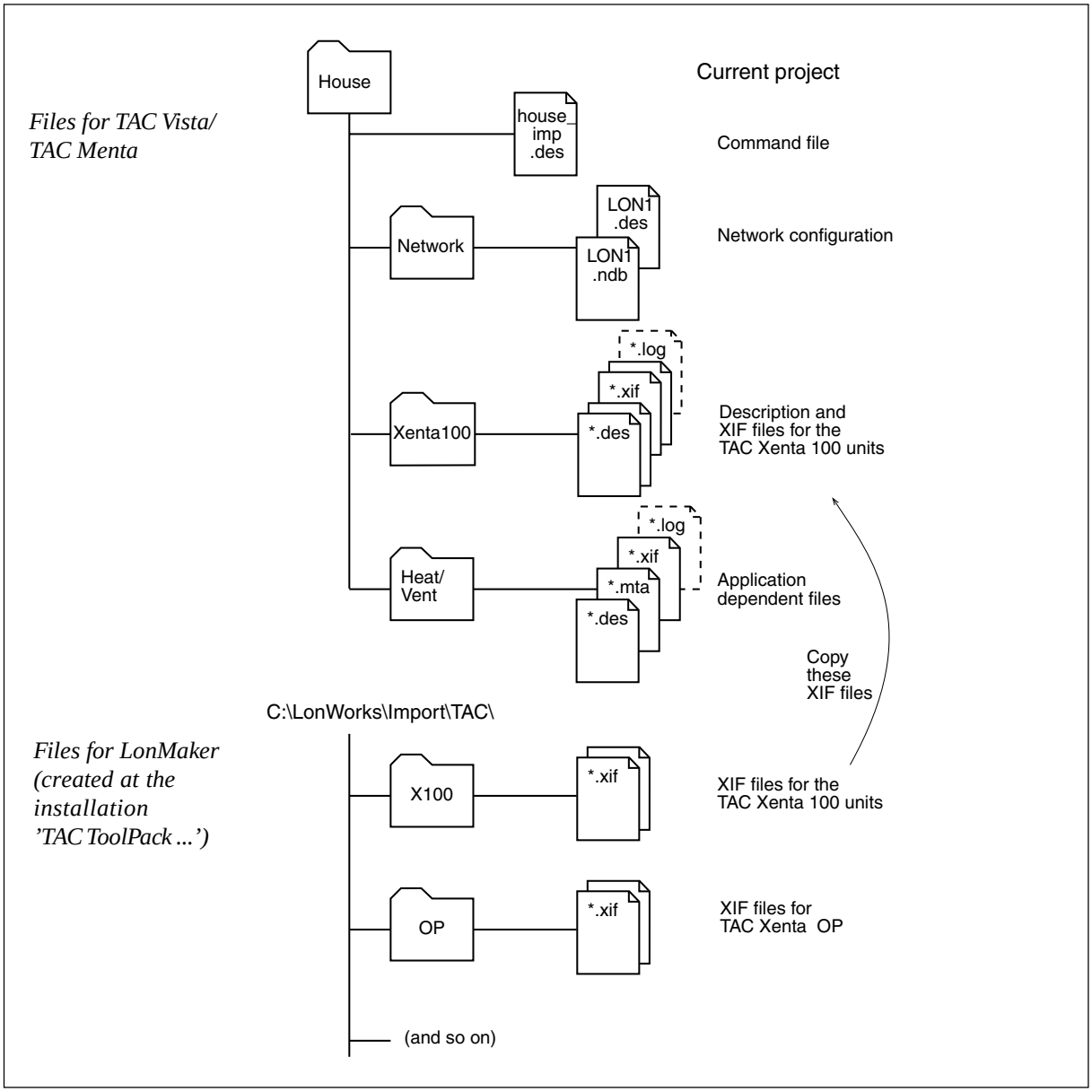
2 Preparations

2.1 Windows environment

2.1.1 Project library

LonMaker Network Management Tool must be installed. All work files should also be put in a project library, structured something like the one below.

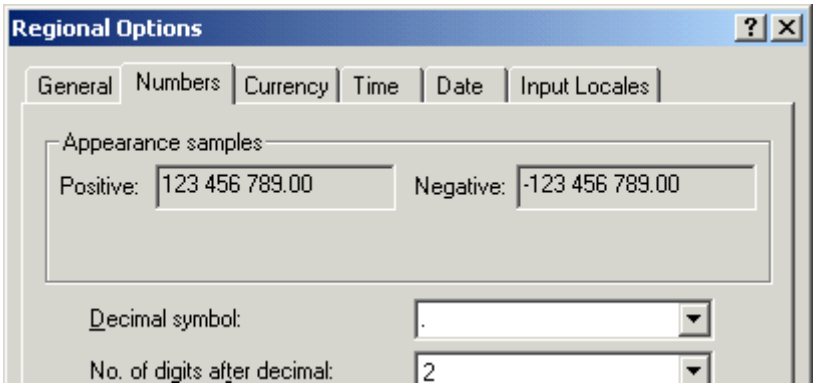


Suggested project library for XIF-files and other working files

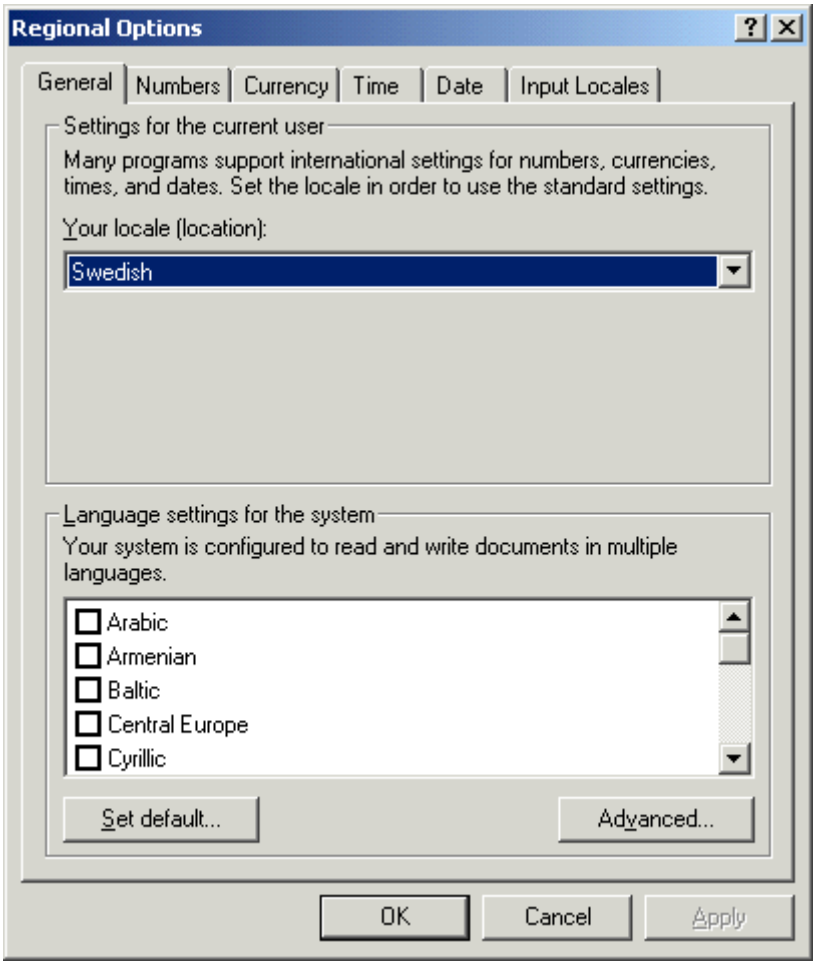
2.1.2 Decimal symbol

LonMaker assumes that the dot (‘.’) is used as the decimal symbol. This is the reason why it is very important that you let the general settings of Windows specify the dot as decimal symbol.

Start **Settings – Control Panel** and open the **Regional Options.** (The designations may differ slightly between the different Windows versions.) Under the header *Numbers* select the dot (.) in *Decimal symbol*.



If the installed Windows has an inherent language different from what you have specified under *General, Settings for the current user* you must also click on *Set default ...* to make the change universal.



2.2 Installation of LonMaker Tool

LonMaker Tool Put the CD with the *LonMaker Tool* program in the CD reader.

Select program installation. Please note that you do not have to restart the PC before all programs have been installed.

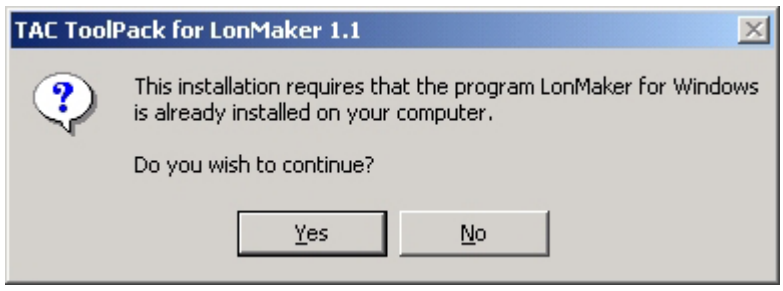
If you know that you are going to use Echelon's LonPoint modules, you will have to install Plug-ins for these, otherwise we recommend that you postpone the installation until they are needed. If you still prefer to install the Plug-ins, you should be aware that creating new networks, for example, will take longer time.

Follow the installation instructions appearing on the screen.

TAC ToolPack for Echelon LonMaker

TAC specific directories and files are generated with an installation kit that can be fetched from TARAI.
Note! LonMaker must be installed first.

Start the installation of '*TAC ToolPack for Echelon LonMaker*' by double-clicking on the file Setup.exe. The first question is a reminder that LonMaker must be installed first.



Follow the installation instructions on the screen.

When the installation is finished, directories and files have been created according to the lower diagram in the figure on the previous page.

The file *TAC Xenta 100-series.vss* contains *stencils* with *shapes* for pre-configured TAC Xenta 100 units and function blocks, where all network variables (except the configuration parameters) are available.

The file *TAC Xenta 400-series.vss* contains the corresponding data for TAC Xenta OP and I/O modules.

The file *TAC Xenta 400 older.vss* contains *shapes* for older versions of the I/O modules. It can be opened in Visio with ***File - Stencils - Open Stencil***. Select *TAC Xenta 400 older.vss* and open.

Now LonMaker should be ready for use.

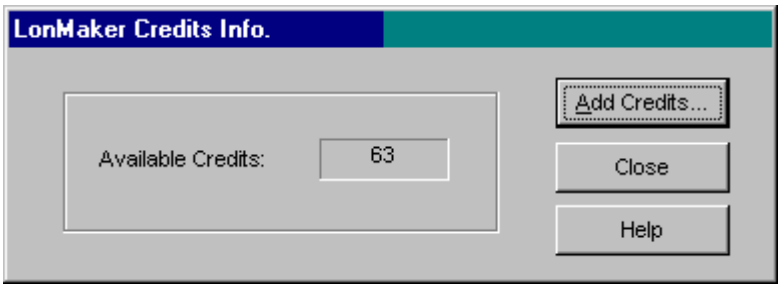
2.3 LonMaker Credits

To be allowed to use LonMaker you must acquire a number of Credits. With the original license there are 64 Credits, normally enough to build a medium network.

Credits are not used for Routers; nor for testing or educational purposes.

No. of available Credits

Go to the tool bar and select *LonMaker - LonMaker Credits Info*:



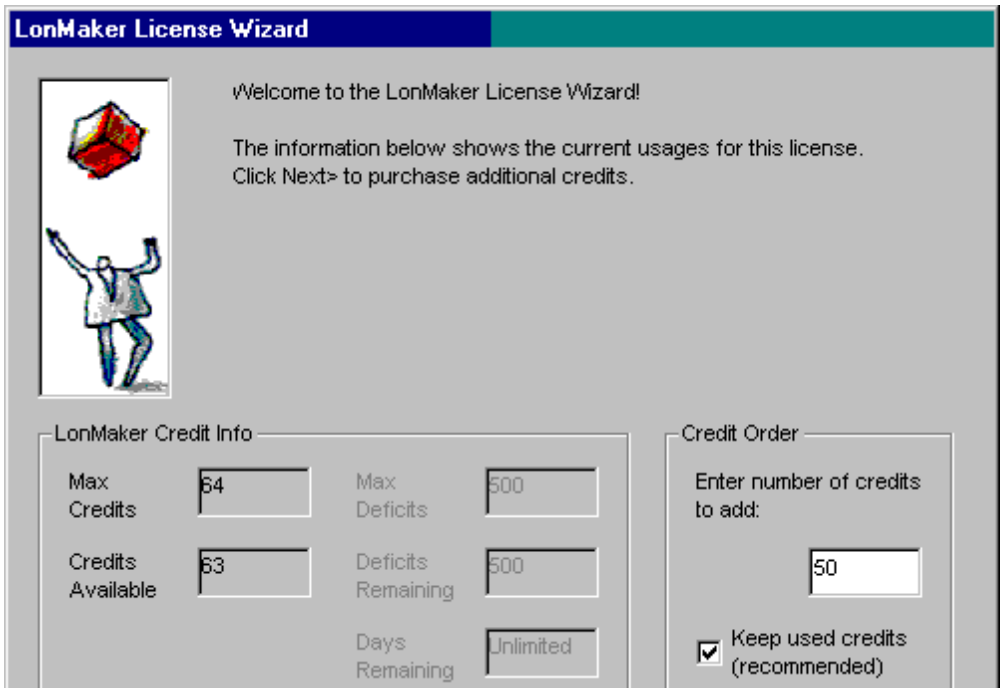
Available Credits shows the number of remaining Credits.

Order more Credits

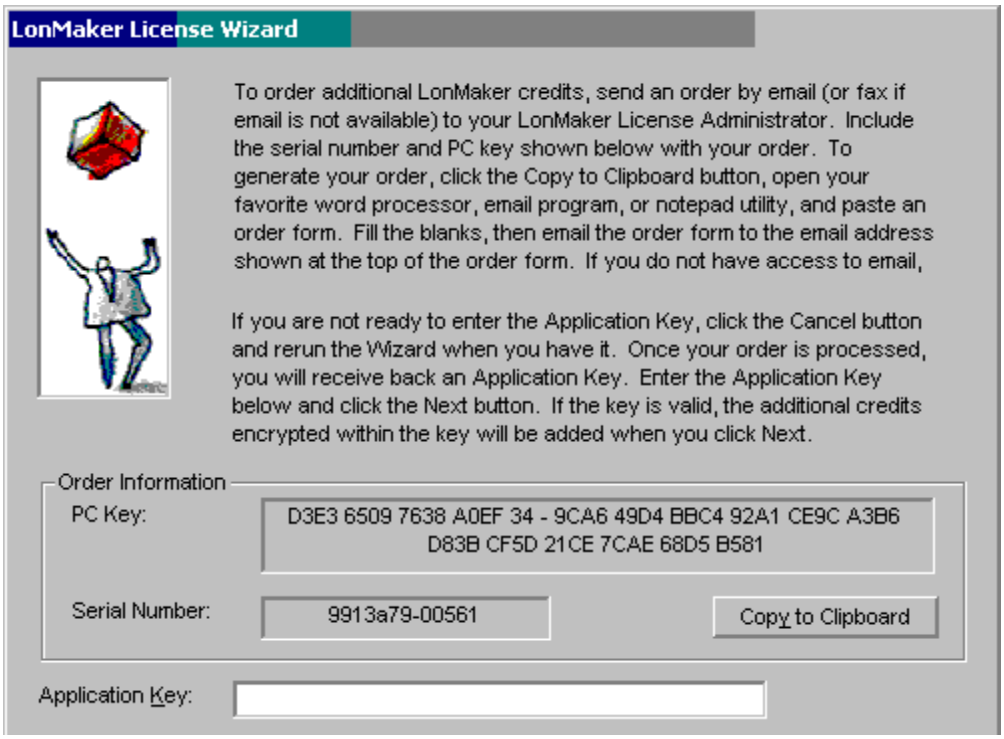
More Credits can be ordered from TAC in the following way.

The first time: open the file *orderfrm.txt* in the LonWorks folder (normally in c:\LonWorks\LonMaker\). At the FROM section, enter your address, phone no., etc. These items will then accompany all your future orders.

Click on **Add Credits ...** in the window above.



Enter the required number (*Credit Order*, even multiples of 10, a minimum of 50) and click **Next**.



Based on the serial number of your PC and internal ID information a key is generated, *PC Key*, which is unique for your computer.

By clicking on **Copy to Clipboard**, you will get a form with this and all other relevant information, all ready to be pasted into a suitable document, later to be sent via fax or e-mail to the order dept. of TAC.

The form contains your required *number of Credits*.

Also check the applicable *order options* of the form.

An example on this form is shown in “LonMaker User’s Guide”.

At TAC a license key, an *Application Key*, will be generated and returned. Please refer to the example in the Appendix of this manual.

By copying the key into the field *Application Key* on ***the same PC*** and clicking **Finish**, your Credits will increase by the ordered number.

***Note 1**: Waiting for Credits*	Before the new *Application Key* has been received, you are not allowed to do certain things, as these will invalidate you current *PC Key*. You are not allowed to delete or decommission commissioned units or merge networks. You may, however, add or commission new devices or delete devices that are not currently commissioned.
***Note 2**: Lost Credits*	Should credits be lost due to mistakes, node corrections or similar, they may be regained through a Replacement Order.

2.4 Restrictions when using LM3

2.4.1 TAC Xenta OP

The idea with using LNS (LonWorks Network Services) is to have an open system. To achieve this all nodes must be registered in the LNS database. This means that all units which are connected to the network, also Operator panels and I/O modules, must be addressed and installed using LM3.

For TAC Xenta OP with system program version below 3.32 we recommend that you always install the OP.

A considerable drawback with this is that the OP can no longer be moved around in the network. In stead, it must belong to a specific subnet (or, rather, a channel). As the same subnet number may not appear on both sides of a router, this means that a specific OP can never be used on more than one channel, that is, on one side of the router. Therefore, the OP should be mounted permanently in a cabinet or similar.

An OP (TAC mode, see below) which only is connected to TAC Xenta 100 controllers can of course still be mobile, but then it must be connected to the TAC Xenta 100 via the respective room units, and *must not* be connected to a TAC Xenta 300/401.

The advantage with installing also the OP is that you no longer have to define dummy-nodes to reserve addresses for the OP, as it will always have the same address.

Using TAC Xenta OP with system program version 3.32 or higher, it is possible to have a mobile OP. In the OP service menu you can select one of three different modes; MAN, INST or TAC.

INST Of these, it is recommended that you use the INST mode in a LonWorks network. In this mode you can install the TAC Xenta OP, and all the nodes of the network will appear in the LNS data base. Now the OP will get a fixed address and must not be moved. In stead it should be permanently mounted in a cabinet or similar.

MAN The MAN mode means that you can have a mobile OP; the OP will find available addresses on subnet 255, which normally works on both sides of a router without causing problems. In this case the OP is not to be installed in LM3. This means, however, that not all nodes of the network reside in the LNS data base, an exception from the principles of an LNS system.

TAC The TAC mode means that you will have a mobile OP, but that you must define two dummy nodes after each TAC Xenta 300/401. Furthermore, you must check all addresses when changing application or unit. These are reasons why we do *not* recommend this mode, as it generally causes problems later on. As with MAN, not all nodes of the network will reside in the LNS data base.

To be used with TAC Xenta 100, however, the TAC mode must be used, as this is the only mode where OP uses both the application and the zero-length domain. See also section 6.4.

2.4.2 Restrictions on TAC Xenta software and hardware versions

Once again, a reminder about the restrictions on the TAC Xenta controllers to get the correct XIF-files, etc.:

- The **TAC Menta** software must be **v 3.24** or higher.
  Please note that in the dialogue for *Unit Configuration* the box ”*Add new Network variables (SNVT) at the end of the XIF-file*” must be checked.
- The software for **TAC Xenta 301, 302** and **401** must be **v 3.2** or higher. However, if the procedure with “Location String” is to be used, at least **version 3.4** is required.
- **TAC Xenta 301** and **302** must be hardware type **2**.

2.5 Backup/Restore of a LonMaker network

We recommend strongly that you make regular backups of all information about the network, the connected units and their settings.

In LM3 you can specify whether backup is to be made of the *database* and/or the *drawing library*. Backup of the drawing library only is mainly intended for ‘remote work’.

A corresponding choice is made when it is time to restore the network with the *Restore* command.

Please study the *LonMaker, User’s Guide*, chapter 2, the *Using LonMaker Backup Files* section.

2.6 Several integration tools used simultaneously

Several persons may work simultaneously on the same network. All persons not working on the PC with the LNS Server are running *remotely*.

This requires, however, that the network is connected and that you run in a remote mode, either via TCP/IP (’Remote Lightweight Client’) or via the LonWorks network (’Remote Full Client’).

However, only one user at a time is allowed access to a specified Visio file. This file must reside on the corresponding PC and allows, for example, only addition of nodes whose XIF files already exist (no import of any new XIF files!).

For more information please study the *LonMaker, User’s Guide*, chapter. 2, section *Using the LonMaker Tool Remotely*.

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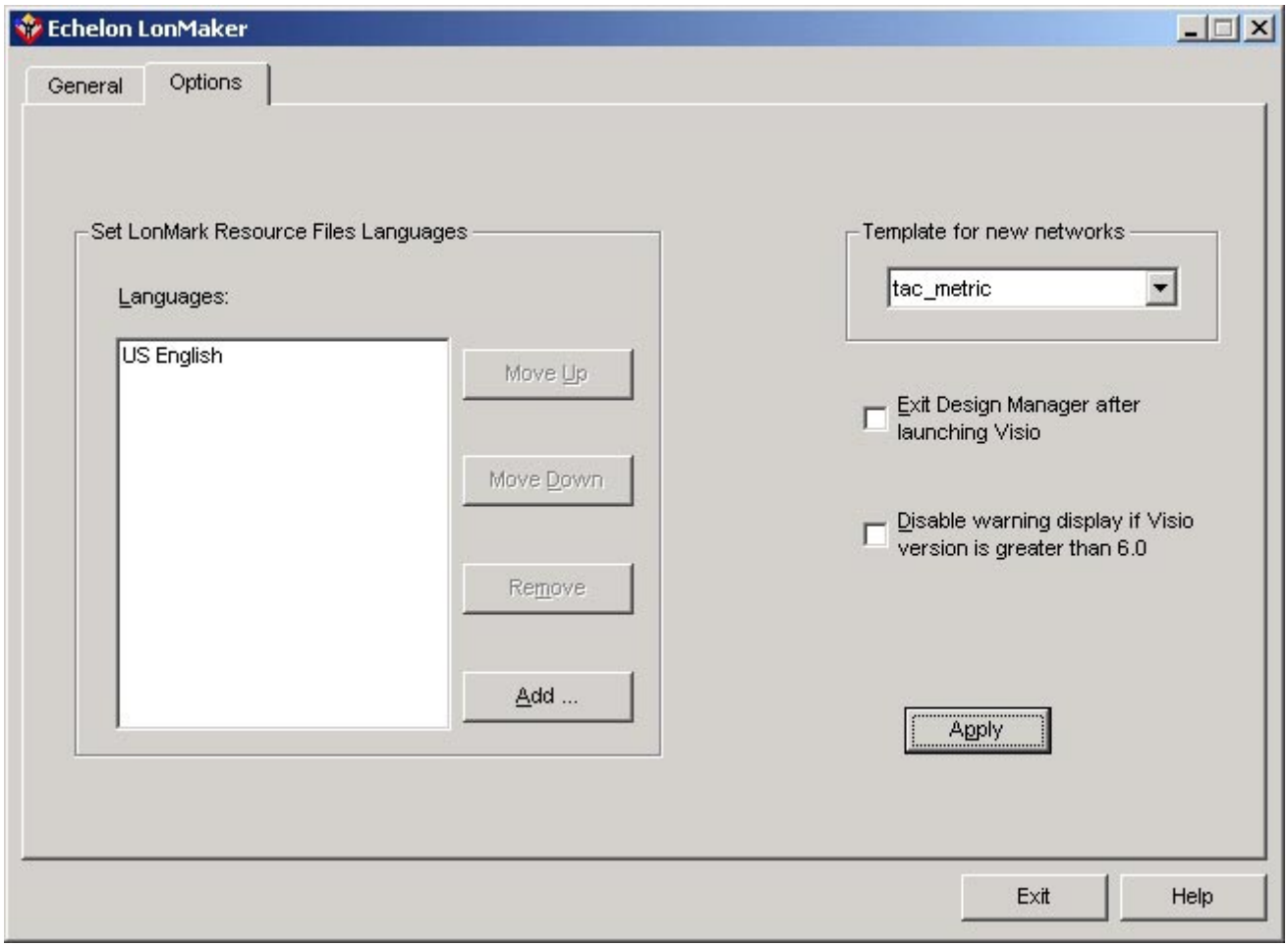
3 Step-by-step: The Network

3.1 Create a new network

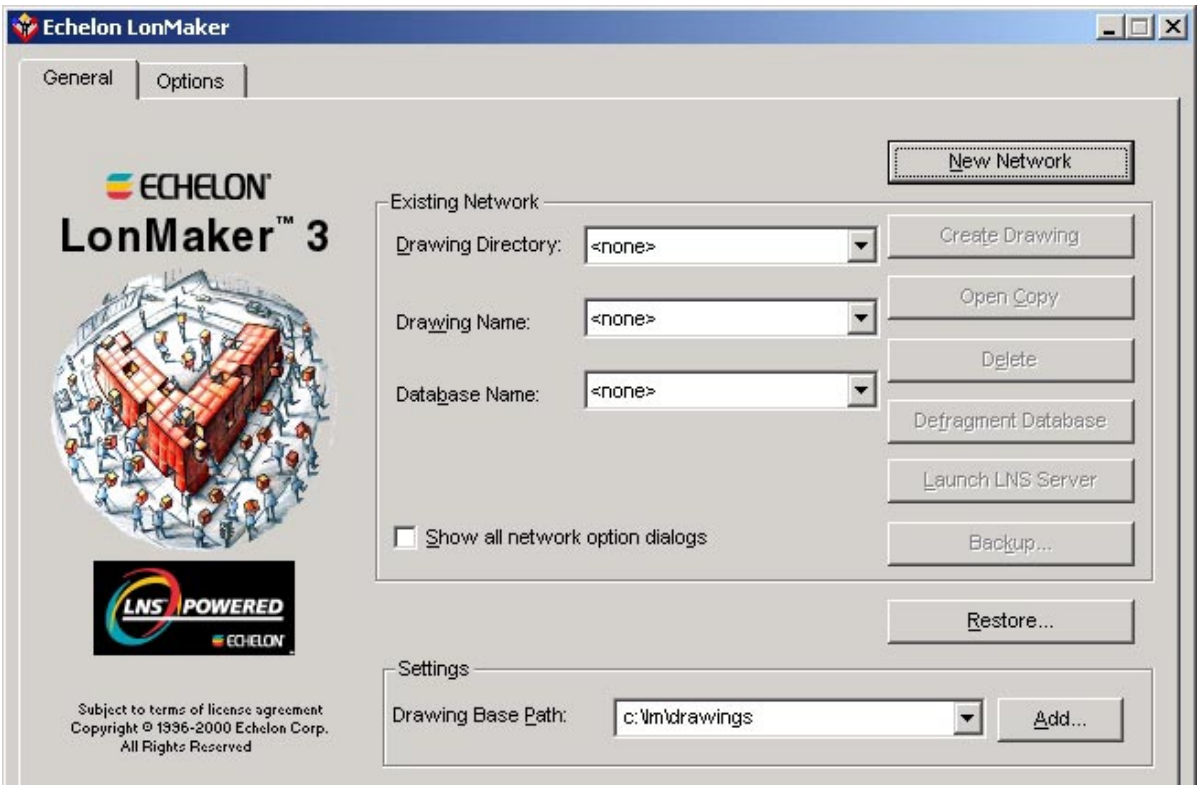
To **create a new network** you begin by starting LonMaker.

Drawing fmt A4 or US Letter Click on the **Options** tab and select which background picture, *Template for new networks*, you prefer. If you check the *Exit Design Manager after launching Visio* box, you will not have to close the dialogue window manually.

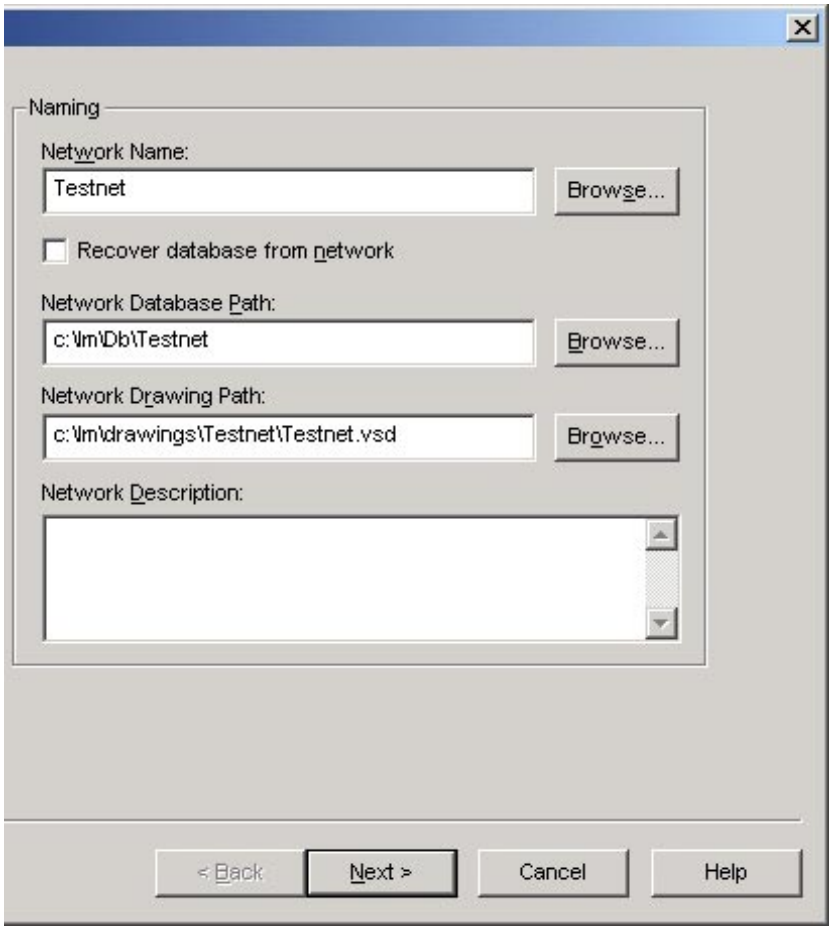
Click **Apply** to execute.



Reselect the *General* tab.



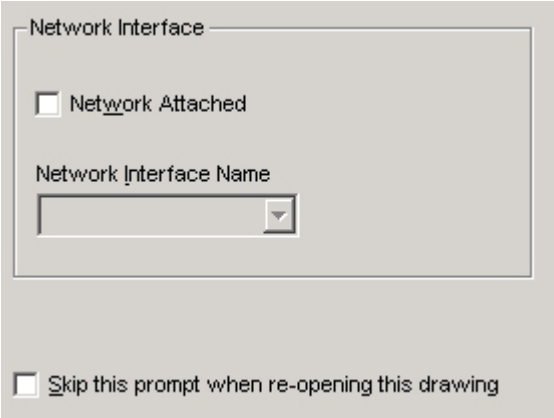
Select **New Network**.



Naming

Give the network a *Name*. This will become the default name of the paths for the *Database* and the *Drawings* (that is, the Visio files in 'Drawing Path').

Then click on **Next >** (as in the succeeding data entries of the ***Network Wizard***).

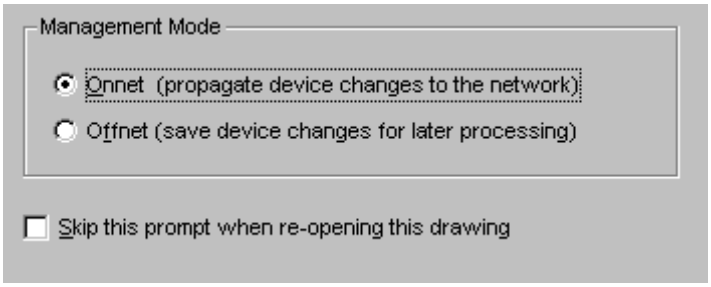


Network Interface

If you work off-line (‘Engineering Mode’, recommended, as commissioning will be much easier) leave the box unchecked.

If you work directly on the network (the Ad hoc mode) you indicate this with a check-mark in **Network Attached**. You will then also have to specify the *Network Interface Name*.

(Leave the *Skip this prompt when ...* box unchecked in this and succeeding windows, as the on-line conditions may differ from time to time.)



Management Mode

(This window appears only if you specified **Network Attached**.)
Onnet: ‘online’

Offnet: (later processing)

Onnet or *Offnet*, this choice may be altered later.

When you work *Onnet* changes will propagate directly to the units in the network. At the command *Commission Device* the node address and other items will be sent to the node.

When you work *Offnet* nothing is sent to the nodes; but still data is stored in the database. At the command *Commission Device* the Neuron ID will be read into the database.

Plug-in Registration

Select which *Plug-ins* are to be registered for the network.

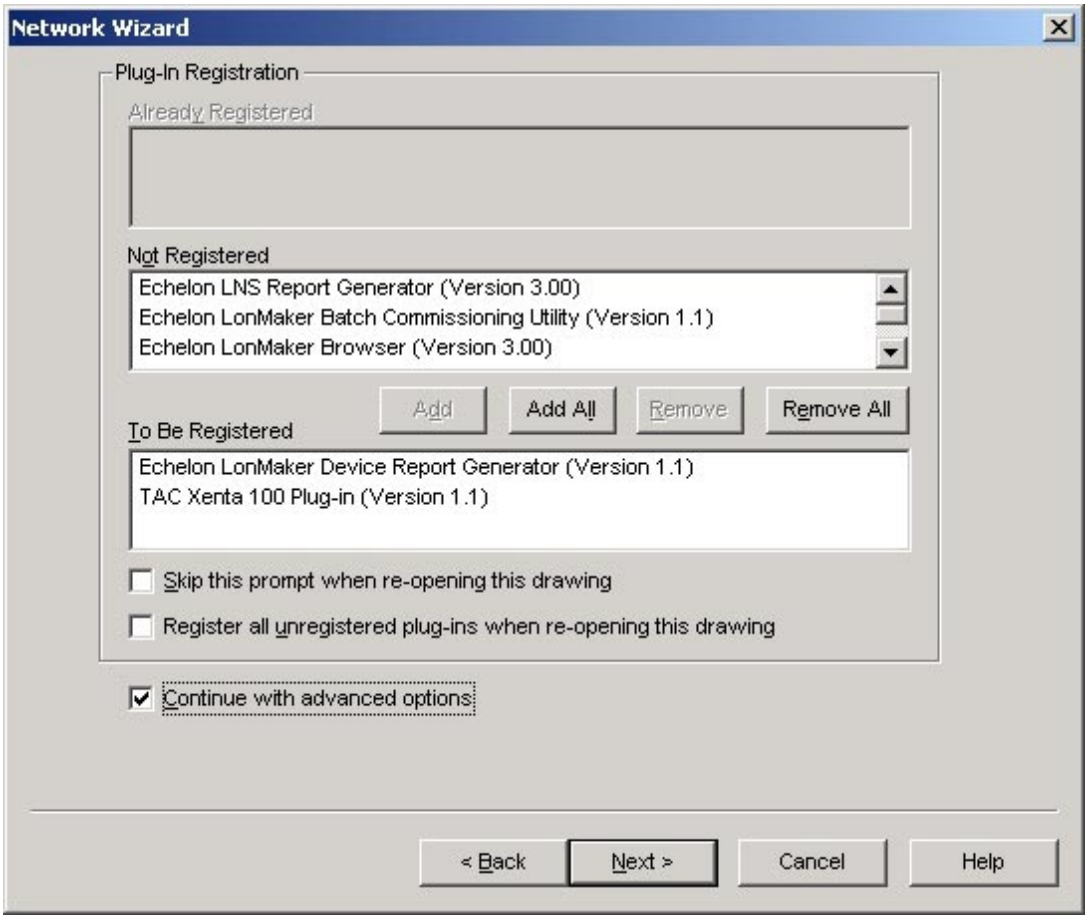
The *Echelon LonMaker Browser* is used to show and modify current values for the network variables of the units.

The *Echelon LNS Report Generator* is used to create documentation from the database. All object data will be included, so some editing, for example in Excel, may be required.

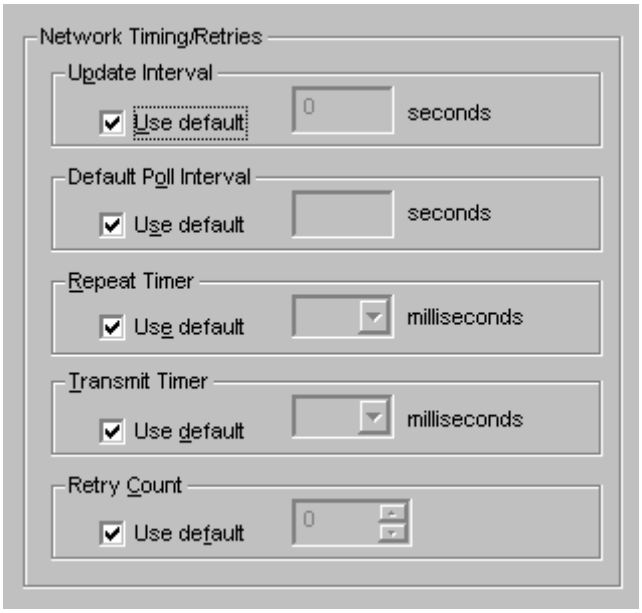
The *TAC Xenta 100 Plug-in* is conveniently installed with the installation kit “TAC ToolPack ... ”. If any type of TAC Xenta 100 is used in the network, make sure that the TAC Xenta 100 Plug-In is registered. Should it be missing in the current network, move the cursor to the toolbar, select **LonMaker - Network Properties…** , click on the *Plug-In Registration* tab, look up the required Plug-In and click on *Add*, to have it registered.

Note! Before you move on, you should check-mark the box *Continue with advanced options.*

It may be convenient to check-mark *Skip this prompt when ... .*

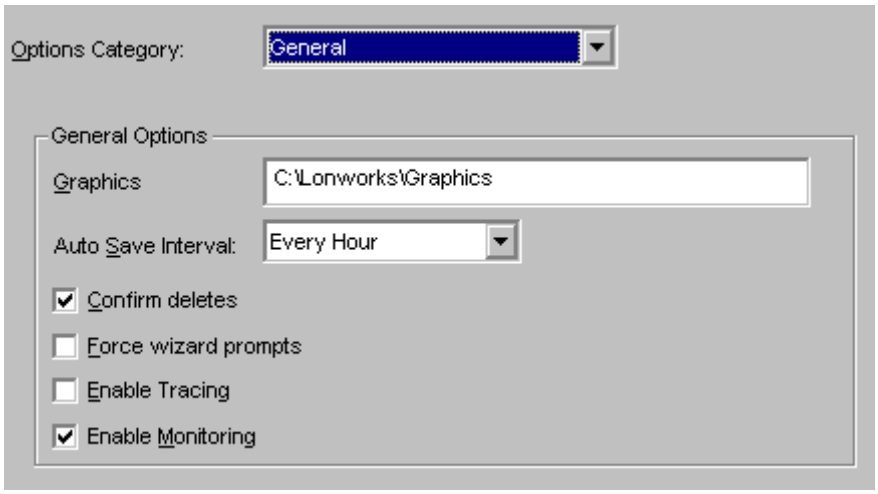


The **Set LonMaker Resource Files Languages** window is passed with a click on **Next >**.



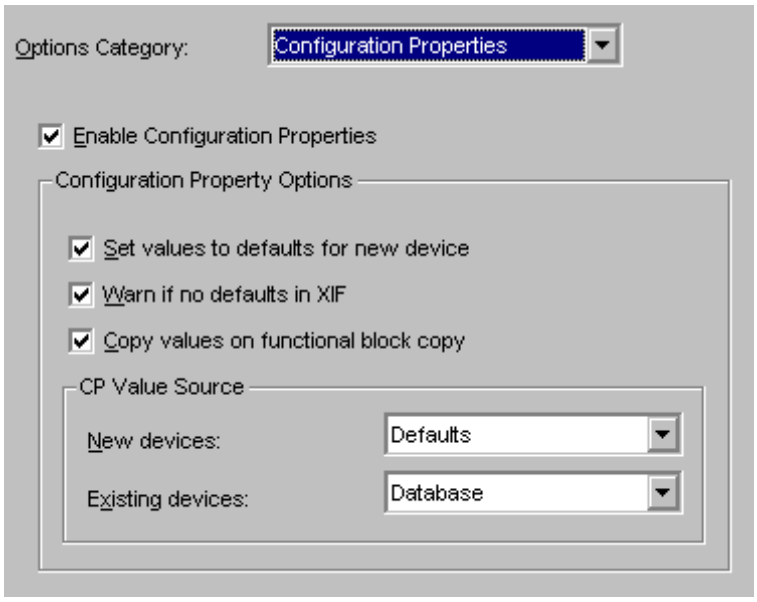
Network Timing/Retries

This is where you enter different transmit and retry timers. Normally you can use the default values.



General Options

A window for certain general settings, for example the *Auto Save interval*. The default value is one hour, which is reasonable, especially as the auto save is done in the foreground and delays current proceedings.

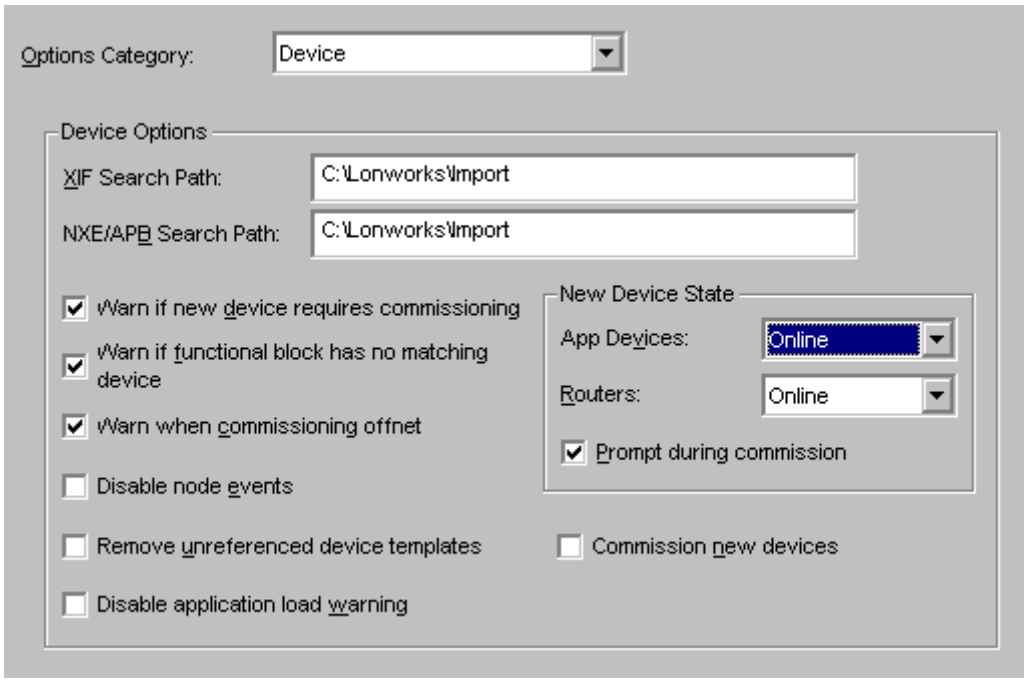


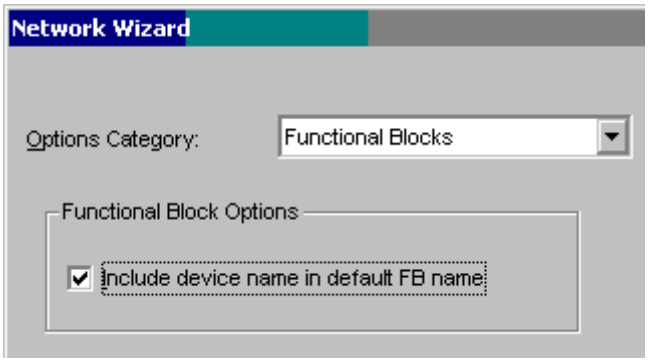
Configuration properties

Settings that specify how new units are to be installed.

Device Options

Settings for new units (below). We recommend that you set **New Device State - App Devices** as *Online*. This will facilitate addressing/commissioning, as the installed units will go directly online, without further action.





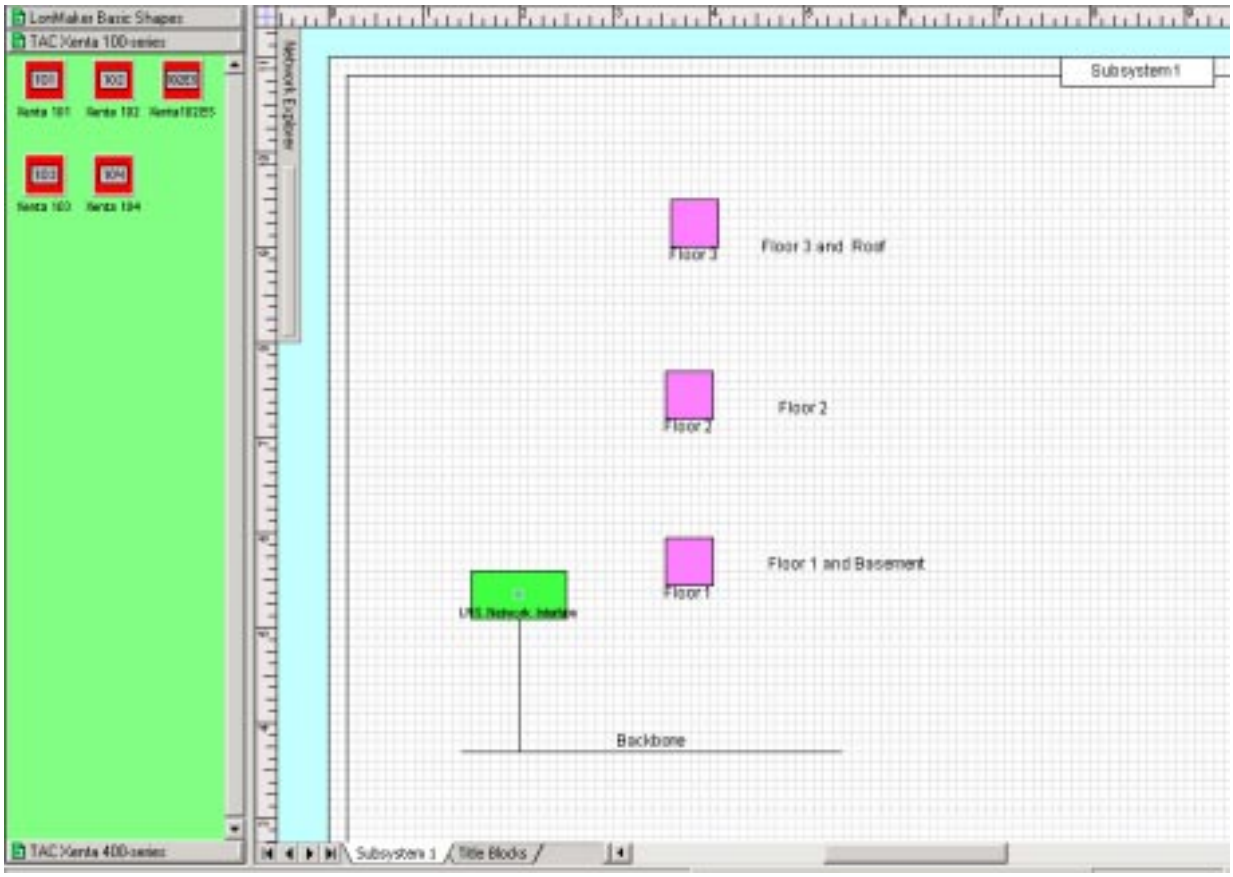
Functional Block Options

Set *Include device name in default FB name* as this will make it simpler to keep track on which function block belongs to which unit. By checkmarking here, you can use the default names of the respective FBs, yet easily see which FB belongs to which unit.

Now the entry of the basic data items for the network has been completed.

Store them in the database by clicking on **Finish**.

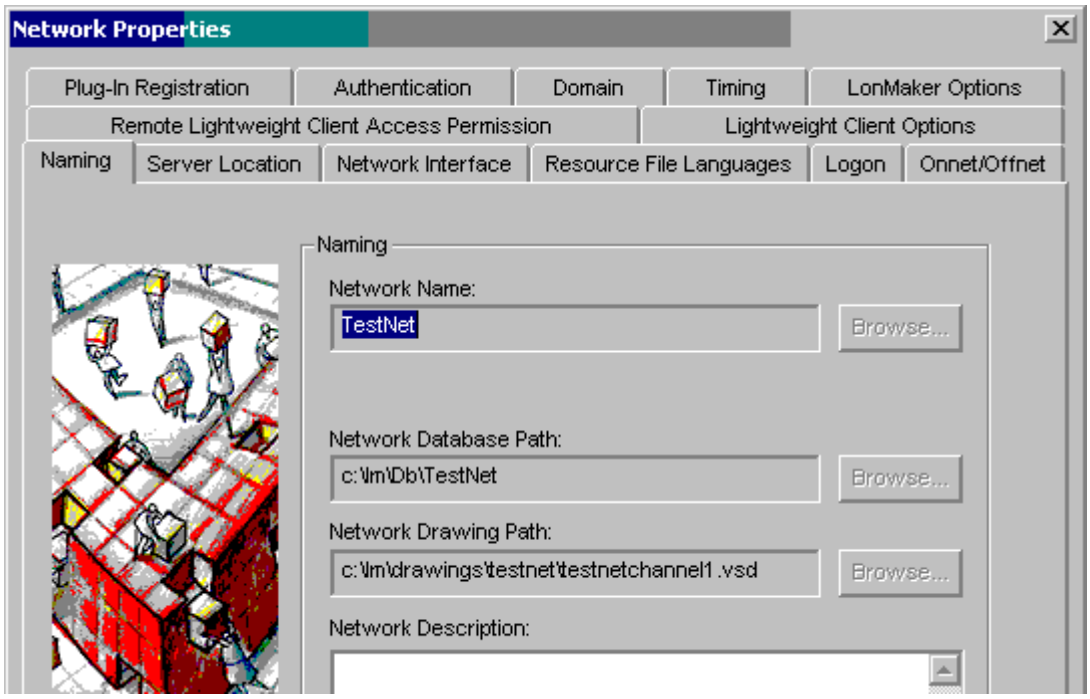
After this you will enter the drawing program Visio with a drawing showing the network interface, that is, your PC connection to the network.



A Visio drawing showing the computer–network interface

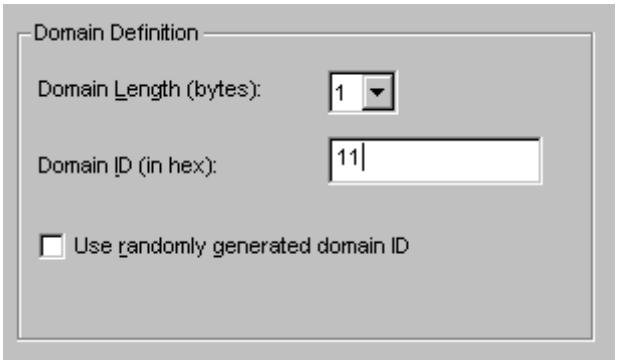
However, there are still some network items that have to be specified.

Go to the tool bar under **LonMaker - Network Properties…**, where you will find the sheets *Authentication* and *Domain* (see next page).



Authentication

Should any of the units, for example a door lock system, need authentication then checkmark the box *Enable Authentication*.



Domain Definition

Indicate how the current *domain* is to be defined.
Entered values are normally used in TAC networks.

After this you press **Finish**.

It is now time to build the network with its channels, routers and application nodes.

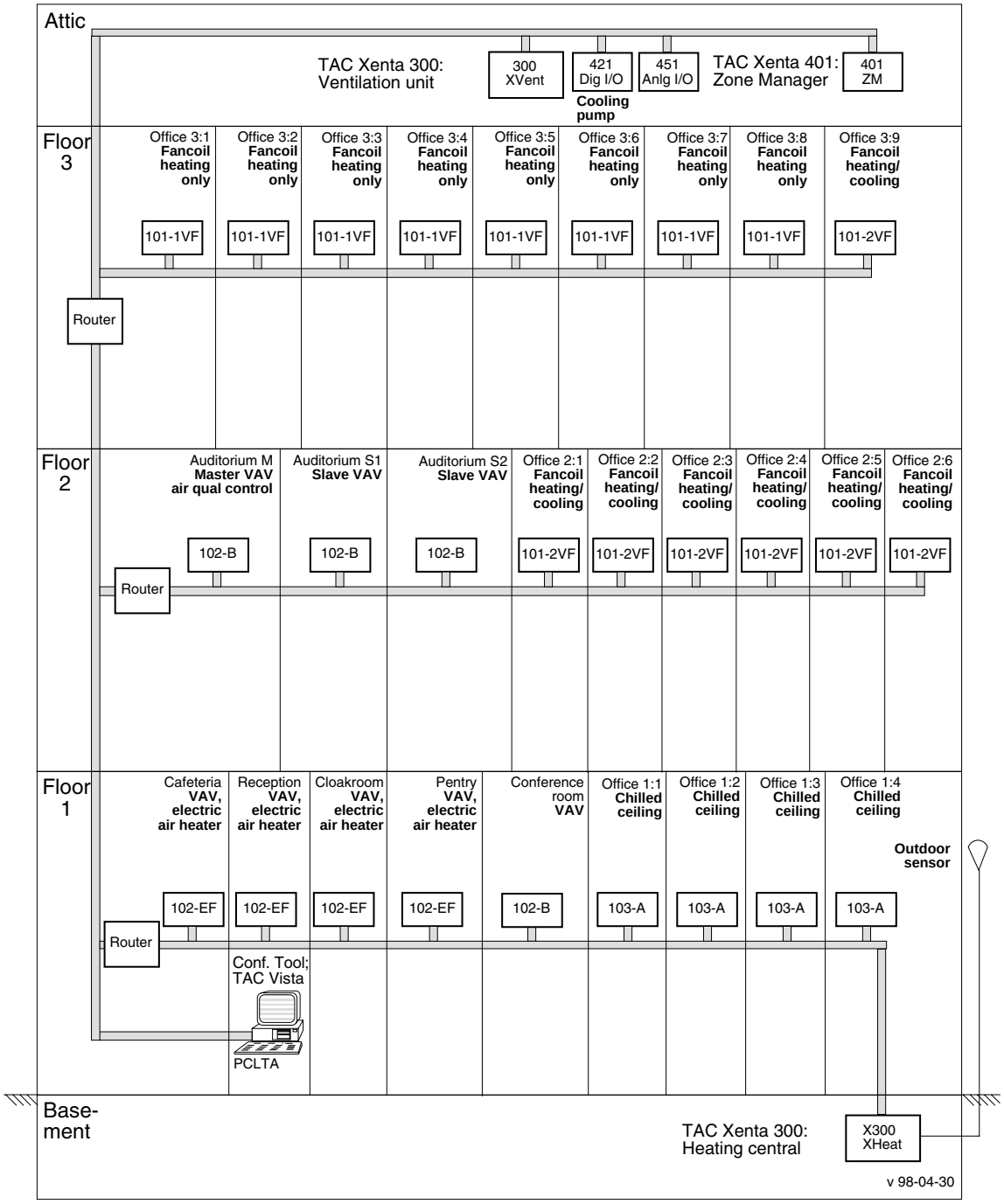
In the remaining part of this chapter we will show a small demo example: a minor Zone system and how its layout may be arranged in the Visio drawing program.

3.2 Network: demo example

Our example is designed with

- two TAC Xenta 300 to control heating and ventilation
- one TAC Xenta 401, acting as Zone Manager
- 15 TAC Xenta 101 to control Fan-coil heating/cooling
- eight TAC Xenta 102 for VAV control
- four TAC Xenta 103 to control chilled ceilings

These units belong to a LonWorks network, which is connected through three routers. The network is configured and supervised by a PC connected via an LTA-adapter, for example a PCLTA card.



3.3 Graphic disposition in LM3

As LM3 (Visio) has a graphical hierarchy, you should before creating the network, think it through, the way the network should appear on paper. A general piece of advice is to put at the top

- the LNS interface
- one subsystem for each channel

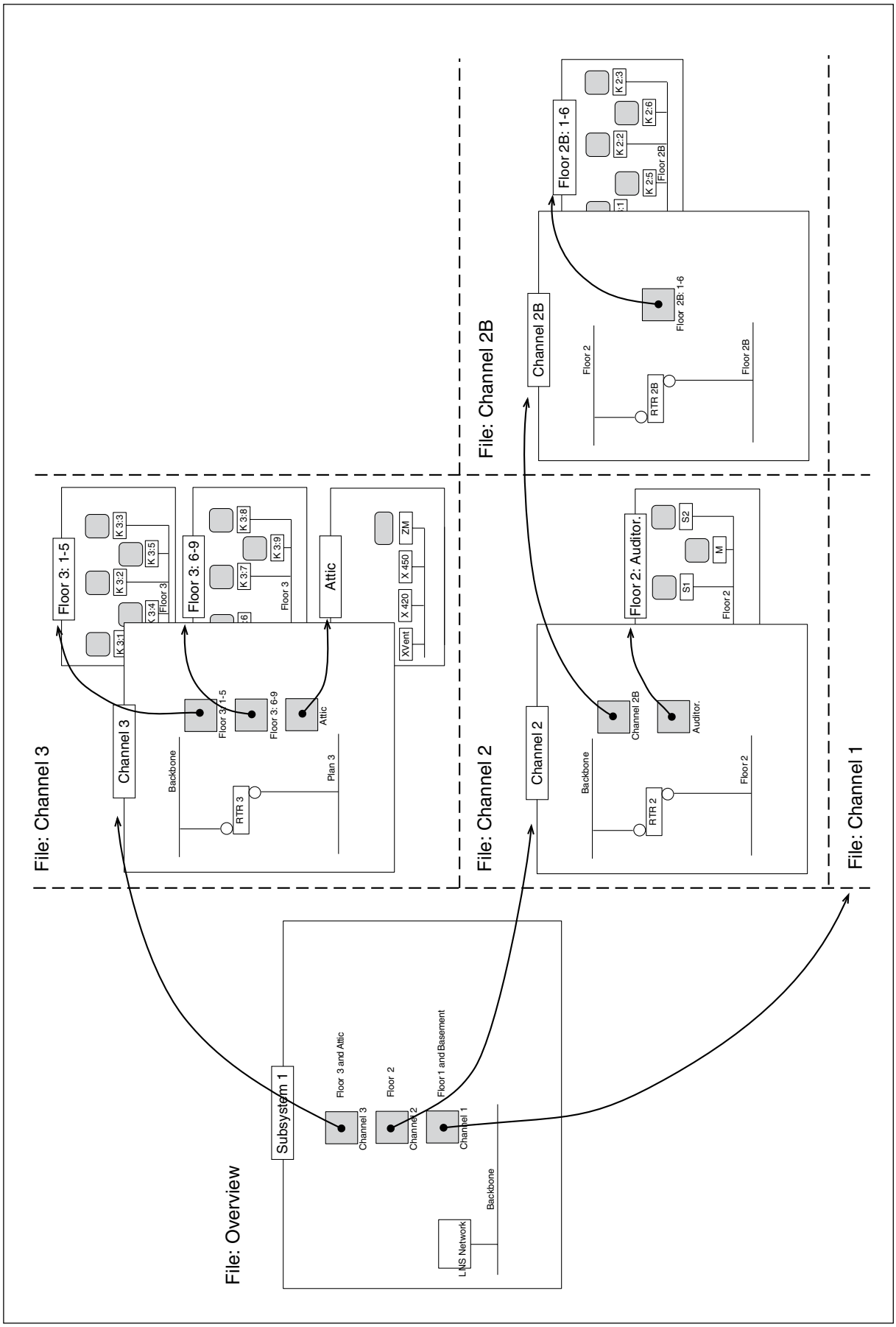
At the top of each subsystem we then put supervisory network functions, like routers etc. and a number of subsystems (secondary drawings).

A subsystem may make up one Visio file; alternatively, up to 10 subsystems (pages) may be included in a Visio file. You should not include more than ten pages in the same Visio file as this may degrade system performance. That is why it is recommended to let each channel have its own Visio file.

The actual distribution must be considered for each individual case, depending on, amongst other, the final number of nodes. If there are several nodes in a room, it is convenient to use one page per room, otherwise you can have several rooms per page. The finer the subdivision, the greater the possibility to use copies.

Do not forget that Visio supports commentary texts; make free use of comments so the design will be easy to understand. Remember also that it is often better to comment why, not exactly how; as the latter often is obvious from the picture.

On the next page we show an example on the layout of the demo example network.



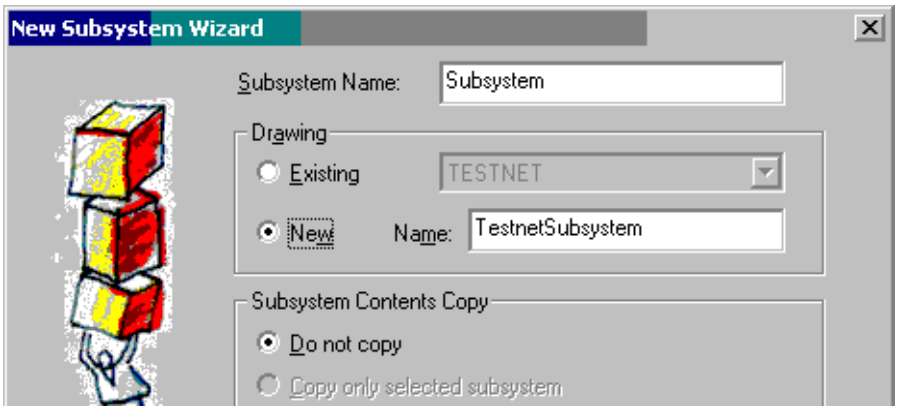
Arrangement of drawings and pages in Visio; an example

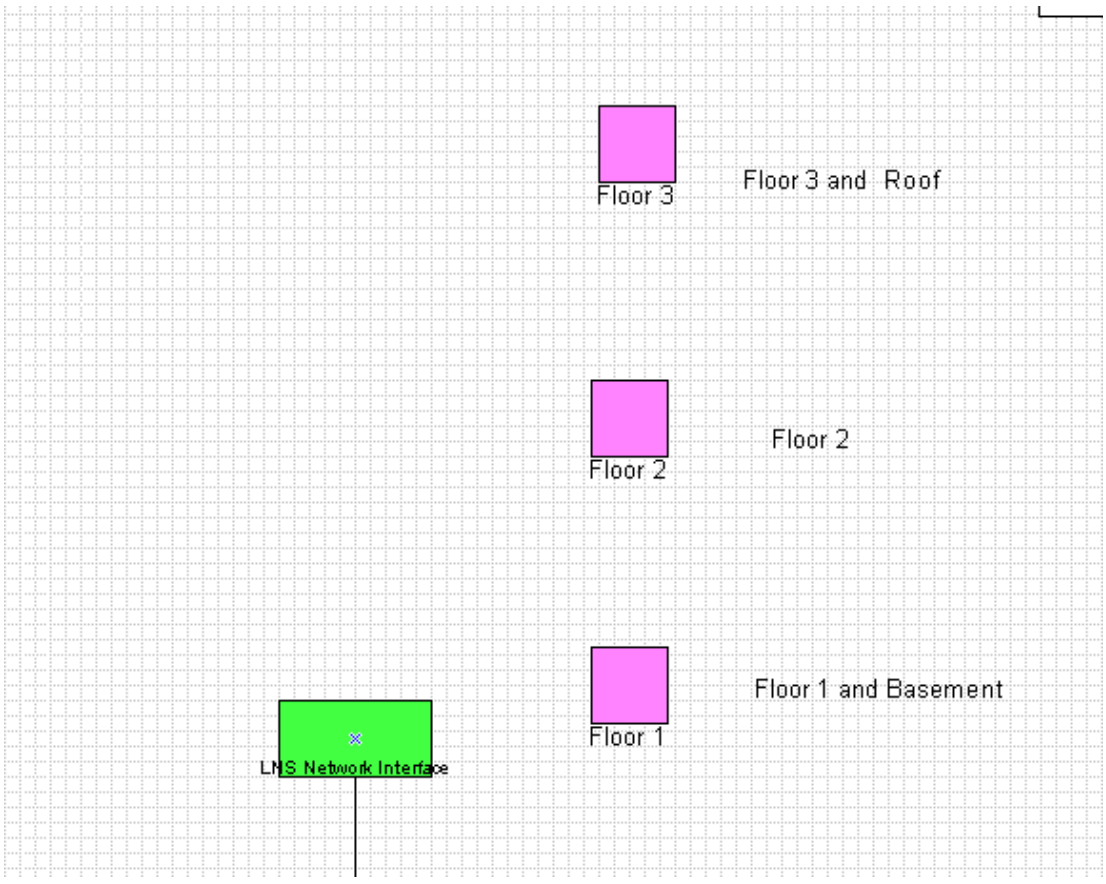
3.4 Some Subsystem examples

We will now return to the Visio drawing we got at the end of section 3.1 and add links (=symbols for subsystems) for those channels that are connected to the Backbone via a router. The new subsystems are created as separate files for the respective channels.

Create new *Subsystems* by pulling the Subsystem symbol onto the drawing.

Here you also specify if the subsystem is to be put in a new Visio drawing file, Drawing - *New*, or in an existing, Drawing - *Existing*. Do not forget, though, the recommendation to store at most 10 drawing pages (subsystems) per Visio file.



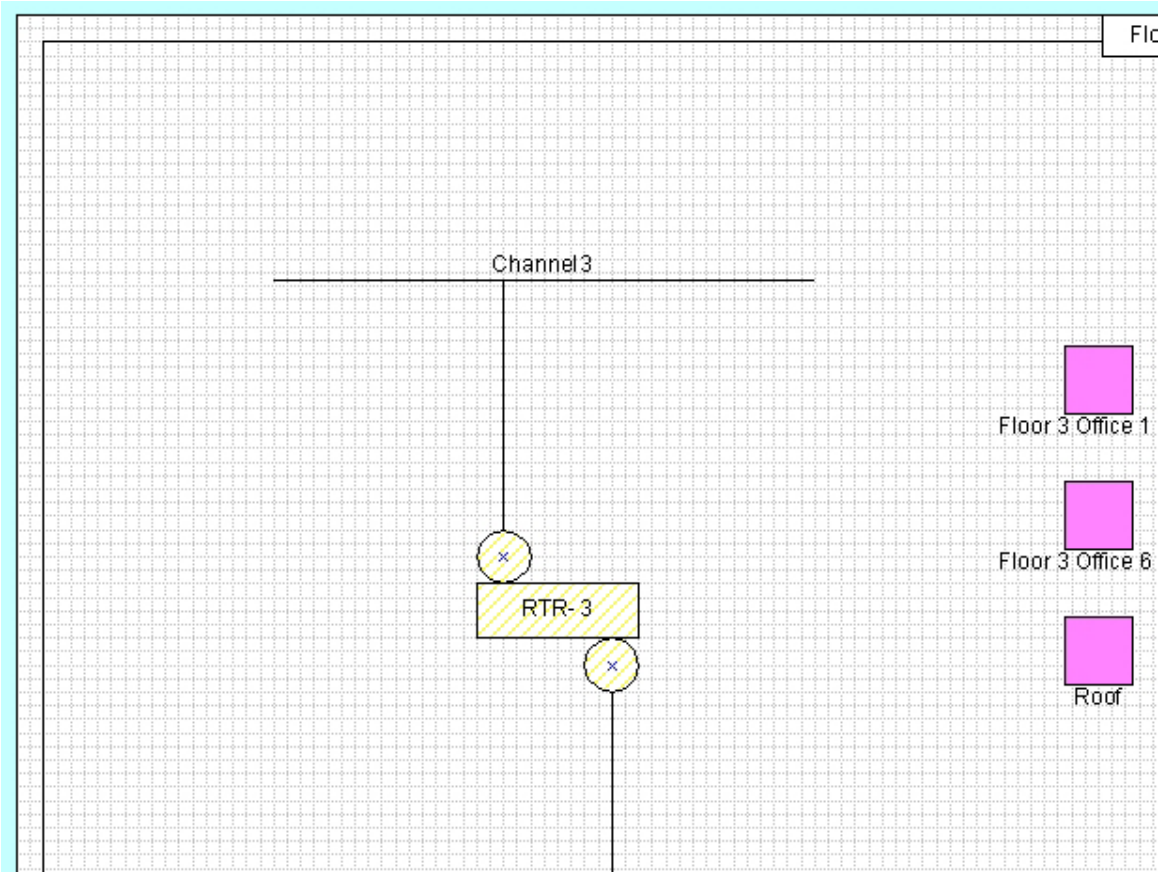


If there are routers in the network that are not connected to the Backbone, they will appear at a lower level of the hierarchy, on the channel where they are connected.

If there are so many channels connected to the Backbone that they tend to fill the page, it is of course possible to create a new page within the current file, in order to keep a clear network overview.

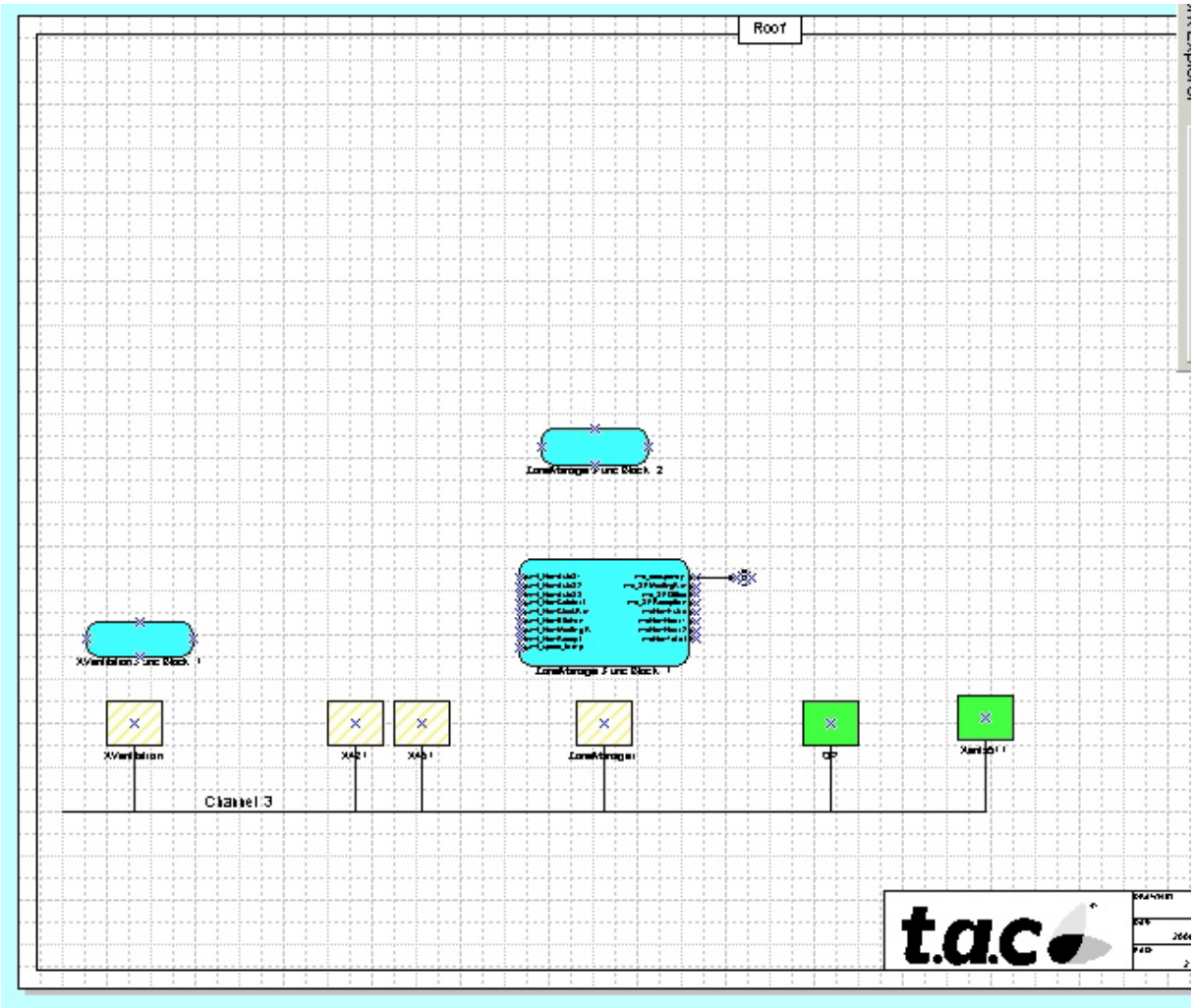
Subsystem *Floor 3* contains *Router 3* between the channel *Channel 3* and the Backbone, and links to the different subordinate pages.

Note! A LonMaker convention is to label *Side A* of a router that side which is closest to the interface of the LNS network.



If there are sub-channels connected to this channel, you add links for them in the same way as before, that is, each channel in a new subsystem (and a new file).

In the subsystem *Roof* we finally find the actual nodes. It may be an advantage to introduce more levels in the hierarchy. If there are several nodes in a room, it is convenient to use one page per room. The finer the subdivision, the greater the possibility to use copies.



Then the corresponding subsystems for *Floor 3 Office 1 to 5* and for *Floor 3 Office 6 to 9* are created. After that, you continue with *Floor 2* and so on.

Echelon recommends at most 10 pages per file, but often it is better to use fewer, say 5–6 pages per file. Also remember that if several persons are to work simultaneously, you will have to work on different files, even though you are using a common network database.

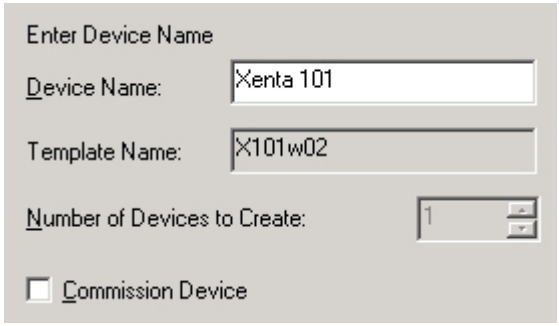
Blank page.

4 Step-by-step: The TAC Xenta Units

4.1 TAC Xenta 100: Unit having a Shape

4.1.1 Putting the Unit onto the Drawing

Point the cursor on the TAC Xenta 101 unit to the left, keep the left mouse button pressed while dragging the cursor to the drawing. Release the button and a '*New Device Wizard*' will start up:



Enter Device Name

Enter a suitable *Name*.

You may have to specify the directory path for the respective *.XIF files ('*Template Name*'). These, as mentioned before, (chapter 2), should be stored in the directory

C:\LonWorks\Import\TAC

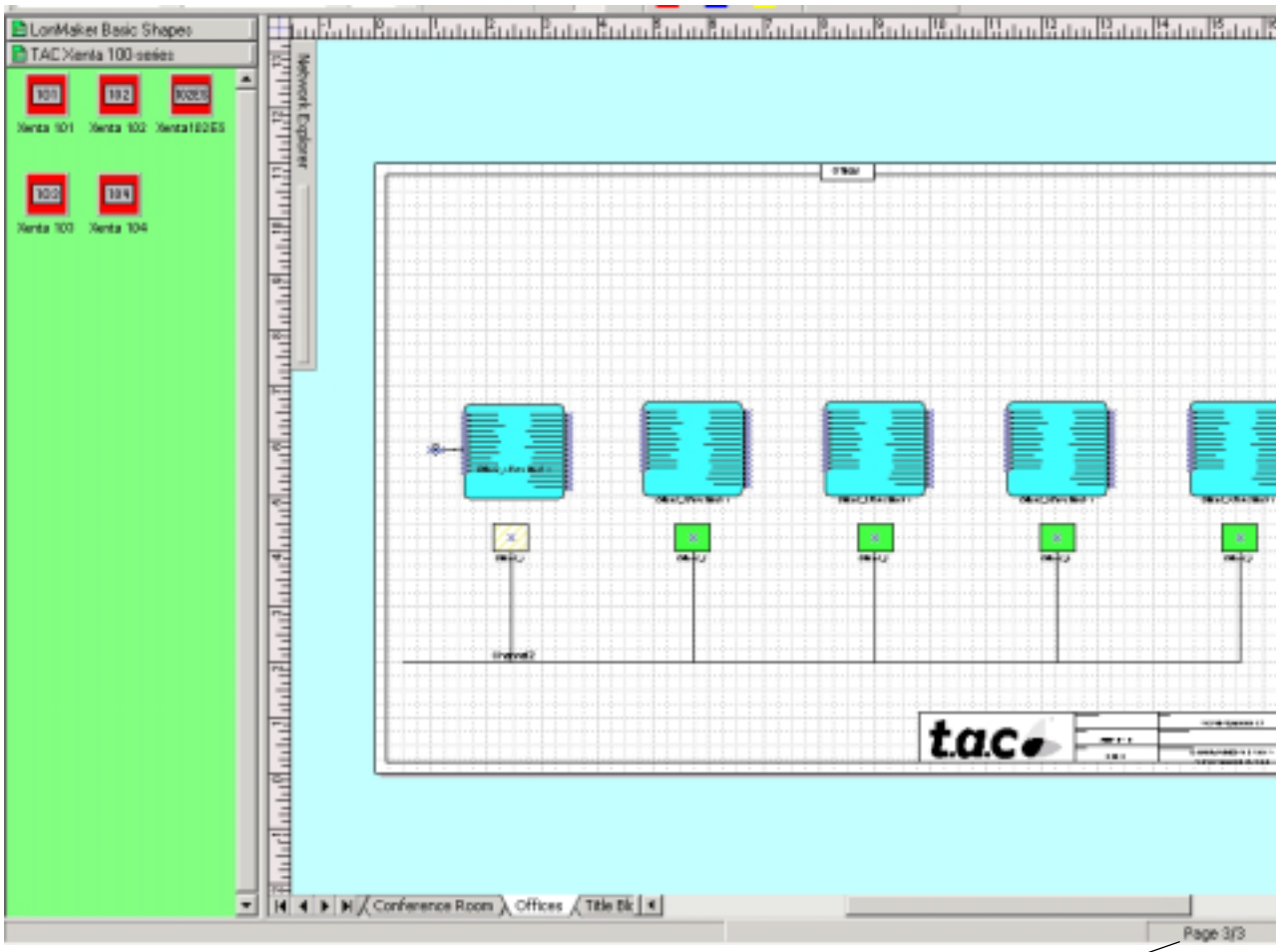
Working on-line, you may *install* the unit (*Commission Device*), but this can also wait.

Specify Device Channel

Check that the unit will be connected to the correct channel:

Specify the *Transceiver Type* of the channel (TP/FT-10 for all TAC Xenta units) and its *Name* (as stated earlier).

Now the unit itself, but also its function blocks with all the bindable variables, will be placed in the drawing (please turn the page).



Note!

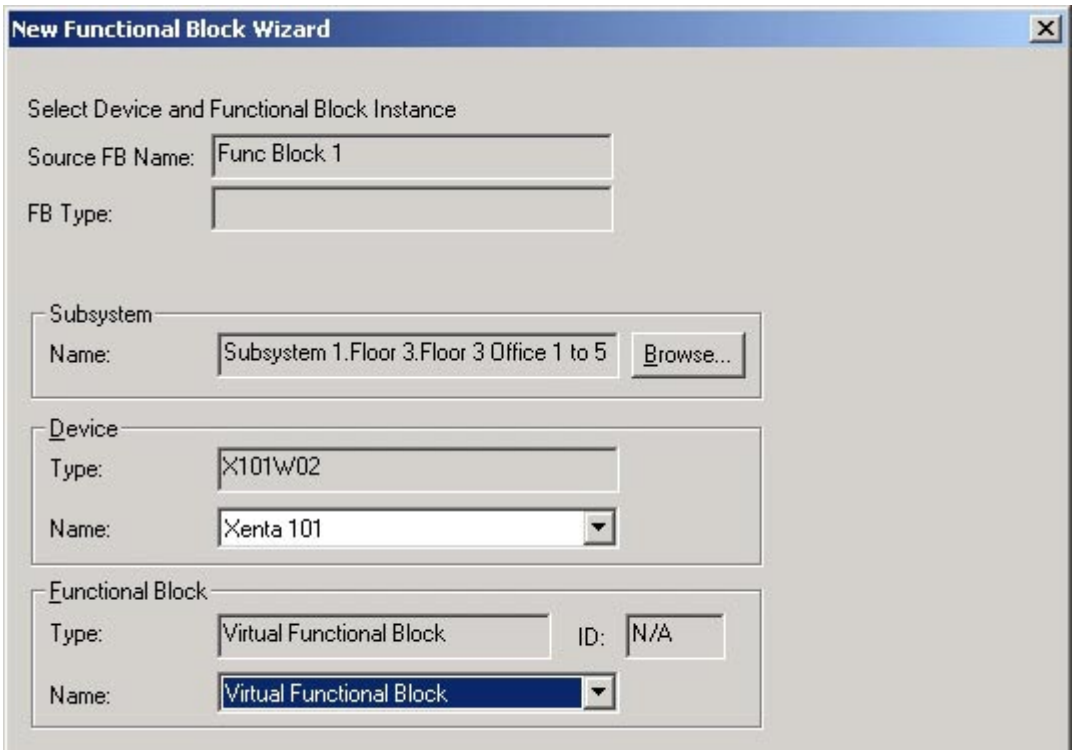
Page 3 of 3 in the drawing file.

After just a few units the page will become cluttered. Try to spread the blocks over the surface so that there will be room also for the intended bindings.

Create new pages as needed, keeping a suitable hierarchy/grouping in mind. After about 10 pages at most, it is time to create a new Visio file.

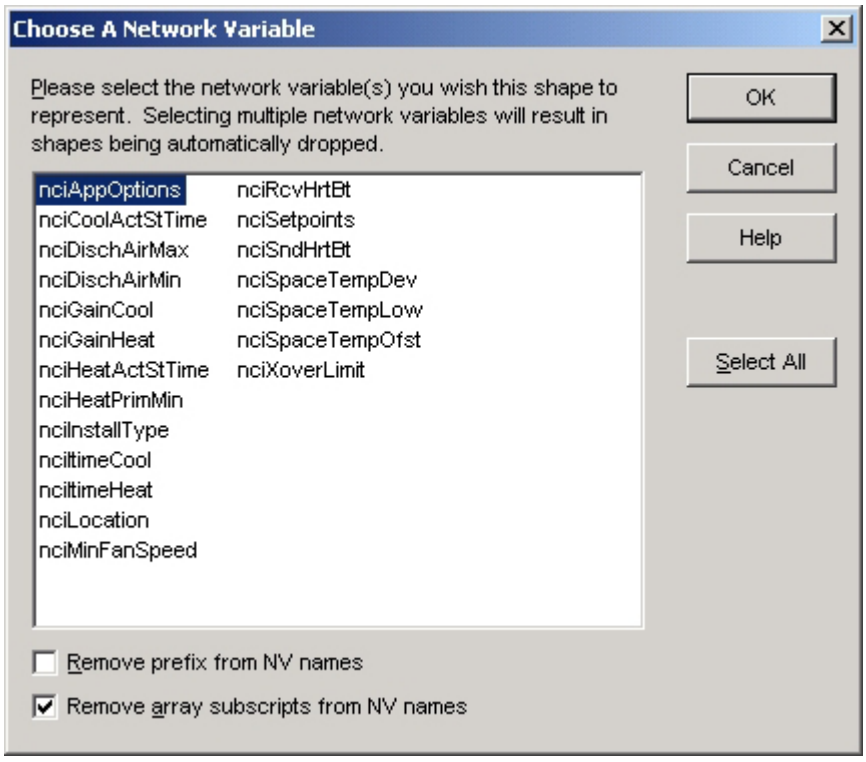
In LM3 it is possible to bind also to *nci* type variables (configuration parameters). If you wish to bind to one in TAC Xenta 100, you must add a new functional block of the type “Virtual Functional Block” (please refer to the next page).

Note! Do not forget that *nci* often is stored in the flash memory or in EEPROM. In that case you must not let the variable be frequently written into, as these kinds of memory only stand a certain number of write procedures.



After a click upon **Next >** you can change the *Functional Block Name:* . You may select the default name (here: Functional Block 1).

Point and drag *'Input Network Variable'* to the functional block and then choose either to add all *nci's* (quickest way, but it requires more space on the drawing) or only to add those *nci's* which will be used for bindings.



4.1.2 Plug-in for TAC Xenta 100

To start the Plug-in

You can start the Plug-in for a TAC Xenta 100 in different ways: right-click on the function block and choose *Configure*; alternatively choose *Plug-ins…*

If you have selected several function blocks, one Plug-in for each TAC Xenta 100 will be started.

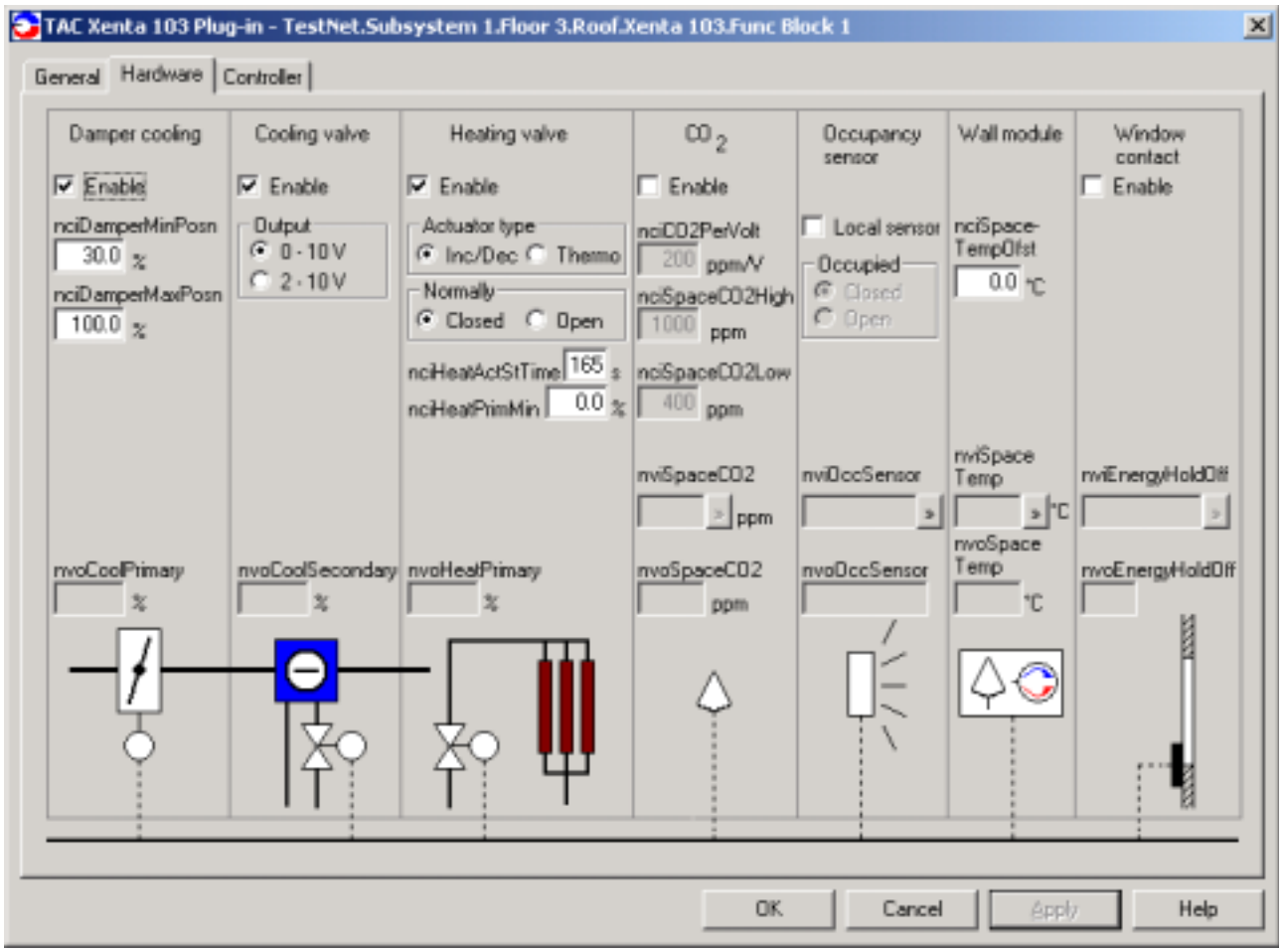
As there are several types of controllers in the Plug-in for TAC Xenta 100, you must the first time specify the appropriate device type.

To use the Plug-in for TAC Xenta 100

The dialogue window of the Plug-in for TAC Xenta 100 consists of three sheets: *General*, *Hardware* and *Controller*. It is simple to switch between the sheets by clicking on the headers or by using the short commands *Ctrl – PgUp* and *Ctrl - PgDown*.

The parameters are explained in the respective TAC Xenta 100 Manuals. The manuals can be reached via Internet at www.tac.se. Those items in the sheets that miss variable names (*nci*, *nvi*, *nvo*) are included as bits of the *nciAppOptions* and *nciSetpoints* parameters.

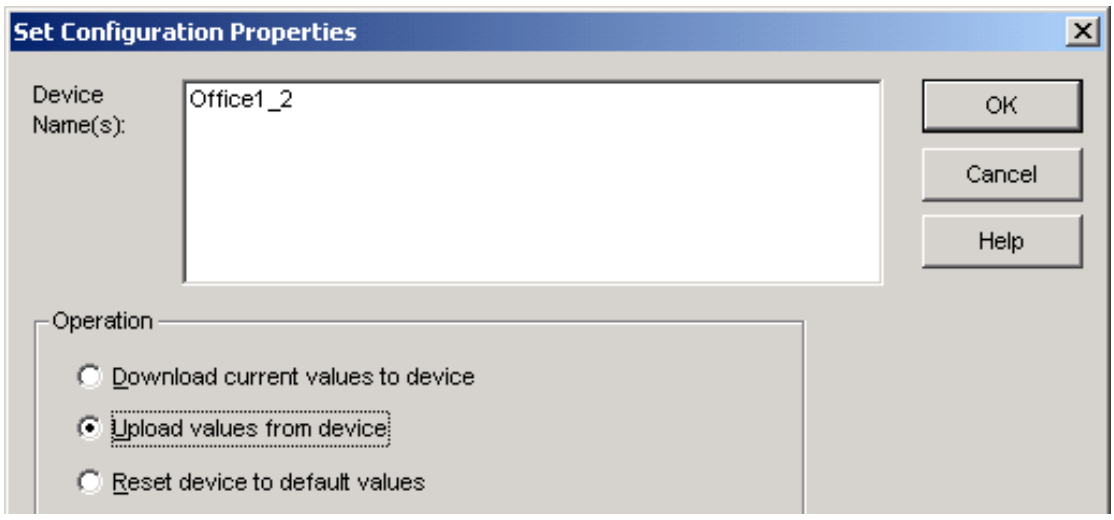
When the Plug-in for a TAC Xenta 100 is started, you will get the *Hardware* sheet. (The pictures below show the plug-in for the TAC Xenta 103A.)



TAC Xenta 103 Plug-in: Parameters that relate to the controlled hardware

nci values The displayed *nci* values are fetched from the *data base*. If the *nci* value in the unit has been changed from, for example, an OP or TAC Vista, the unit's current value will not be present in the data base and cannot be displayed in the Plug-in windows.

To transfer the unit's parameters to the data base ('Synchronize the Configuration Properties') you may, if the unit is online, right-click on the unit, select **Resync CPs ...** and request *Upload values from device*.



When a *nci* value has been changed in the Plug-in window, the *Apply* button is highlighted. As long as the *Apply* button is highlighted, it is a sign that the latest changed *nci* values have not yet been sent to the database. When you press the *Apply* button all *nci*'s that have been changed (compared to the database values) will be sent. So you can send one or several *nci*'s at a time. When the *nci*'s have been sent the *Apply* button will be dimmed again.

nvi values The displayed *nvi* values, however, are in principle fetched from the *unit*. An *nvi* can be changed if you click on the button >> to the right of the respective *nvi*. You will then get a little dialogue box where you can enter the value that the *nvi* is to have. The dialogue box has two buttons, *Set Value* and *Cancel*. If you press *Cancel* the dialogue box will close and the *nvi* will remain unchanged. If you press *Set Value* the entered value will be sent directly to the database (which in turn will forward it to the controller).

To modify a *nvi* is possible only in the *Onnet* mode. Otherwise the button beside the *nvi*'s is not highlighted and you cannot get the dialogue box.

nvo values Displayed *nvo* values are fetched from the *unit*. An *nvo* cannot be changed; it shows only the value present in the database, where it originates from the controller. *nvo* values are shown only in the *Onnet* mode.

Summary:

nci values are fetched from the *data base*.

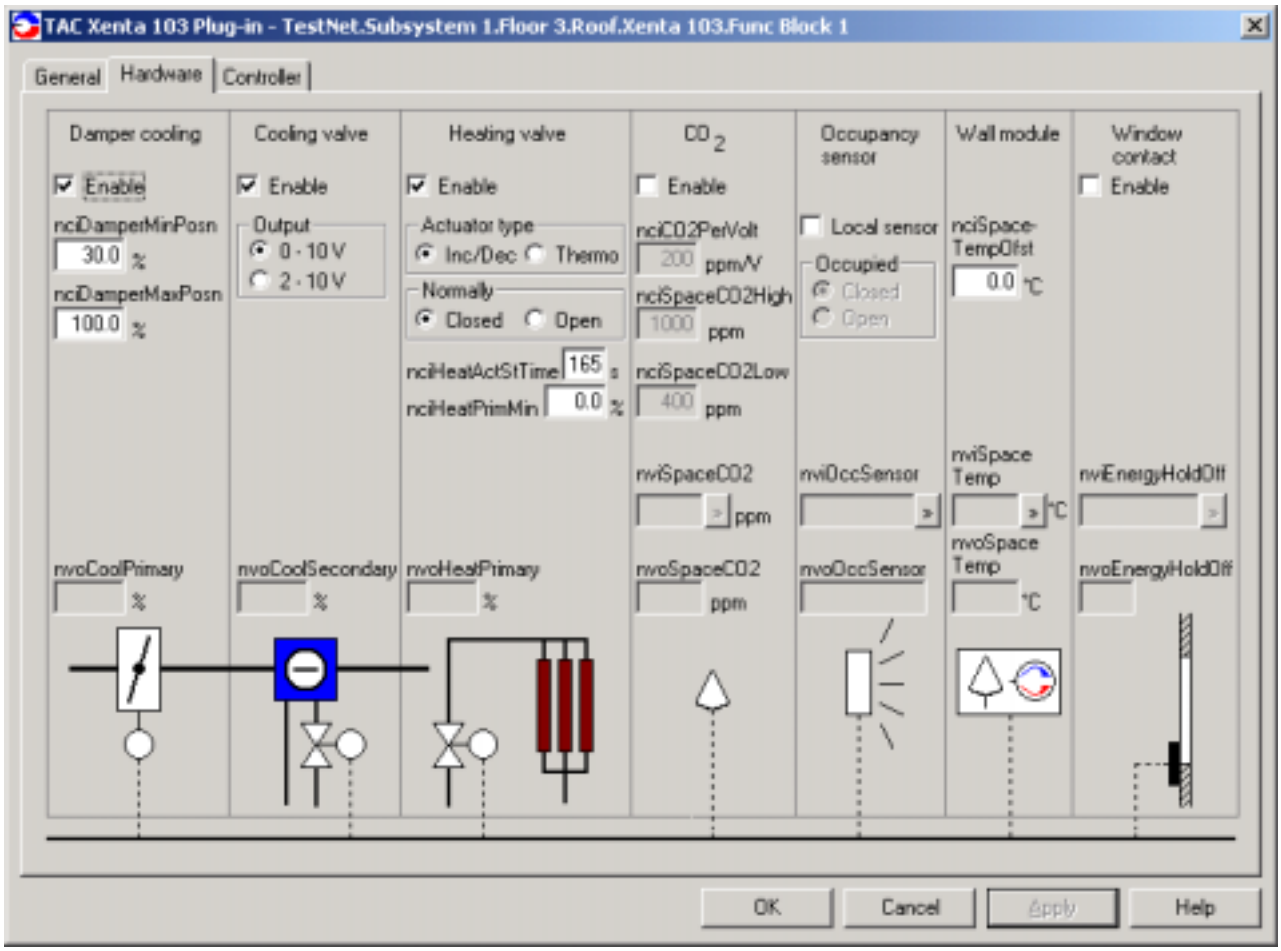
One or several *nci*'s can be modified and sent by the use of the *Apply* button.

nvi values are fetched from the *unit*.

Only one *nvi* can be modified and sent by the use of the respective dialogue box.

nvo values are fetched from the *unit*.

An *nvo* cannot be modified.

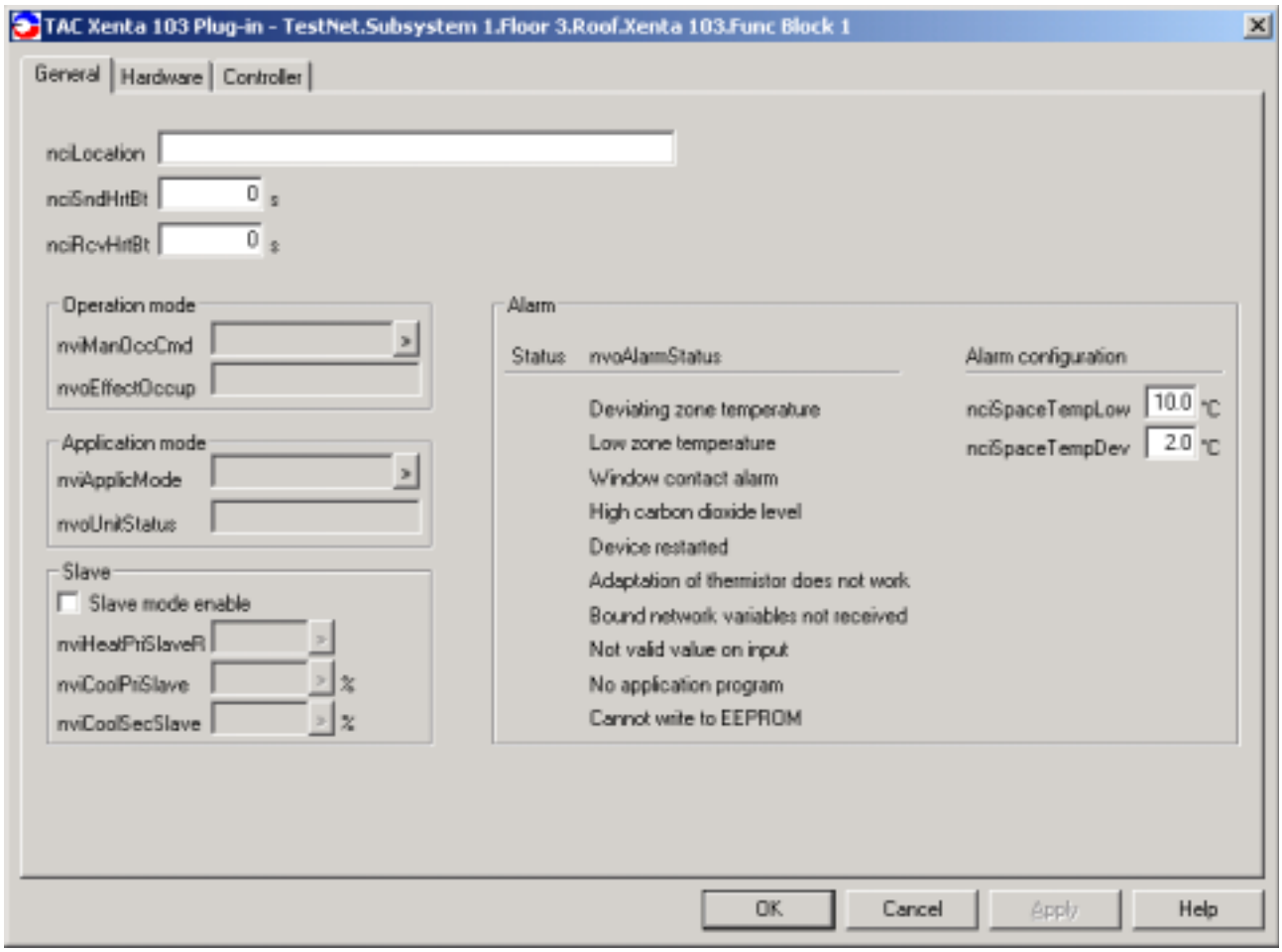


TAC Xenta 103 Plug-in: Parameters that relate to the controller itself

All entries are limit-checked. If they exceed the limits, a buzzer is heard and you will have to make another try. You cannot leave an entry field with an incorrect value in it.

For some *nci*'s this check has been extended to cover other dependent *nci*'s. One example: *nciDamperMinPosn* is checked so that its value does not exceed the *nciDamperMaxPosn* value, etc.

When you position the cursor above the intended entry field, an InfoTip appears, presenting a short descriptive text for the current variable.



TAC Xenta 103 Plug-in: Other parameters

In the Plug-in window title the Plug-in name and the associated function block name are displayed. The names are shown according to the following format:

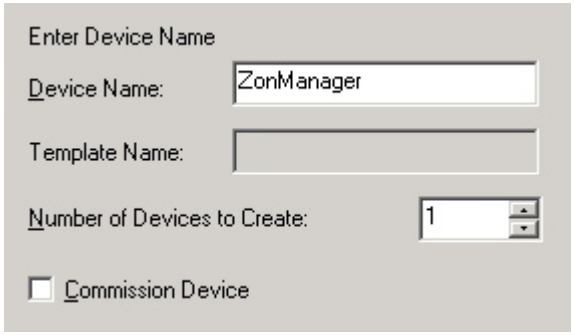
NetworkName.SubnetName.Device.FunctionalBlock

The *OK* button finishes the Plug-in, but sees to that any modified *nci*'s are sent away first.

The *Cancel* button finishes the Plug-in without sending away any modified *nci*'s. This means that if the *Apply* button is not highlighted, nothing will be lost. If, however, the *Apply* button is highlighted, those changes which were made since the *Apply* button last were pressed, will be lost.

4.2 TAC Xenta 300/401: free programmable Device

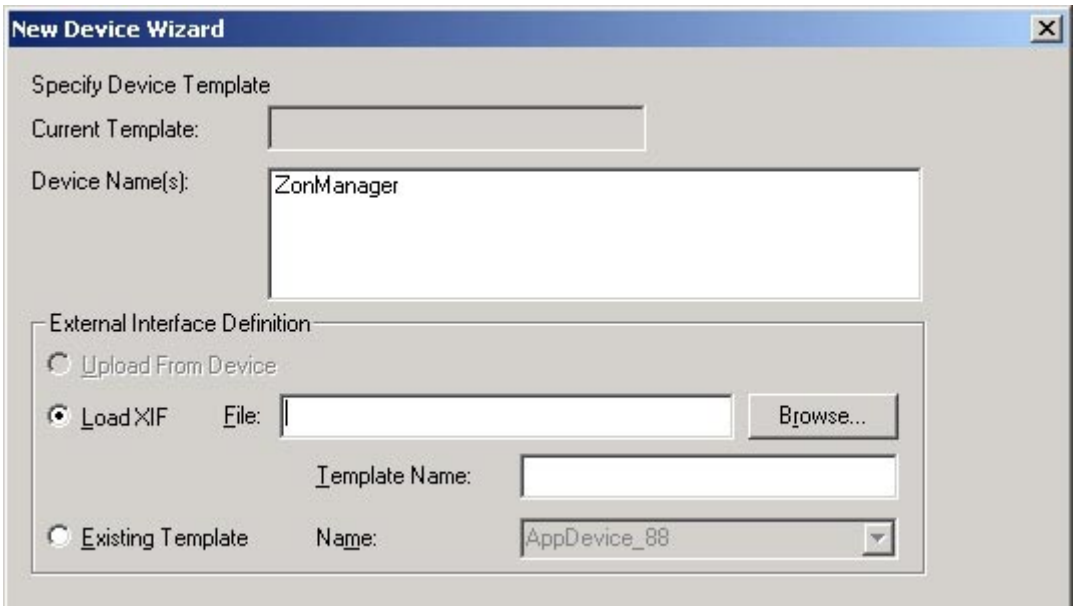
Use the “Drag and drop” technique to put TAC Xenta 300 units on the drawing. As the TAC Xenta 300/401 series consist of free programmable units, there are no ready-made templates, in stead you have to use the general functions of LM3. Select *Device*.



Enter a suitable *Device Name*.

If you want to work on-line, checkmark *Commission Device*, otherwise let it rest.

Then click on **Next >**.

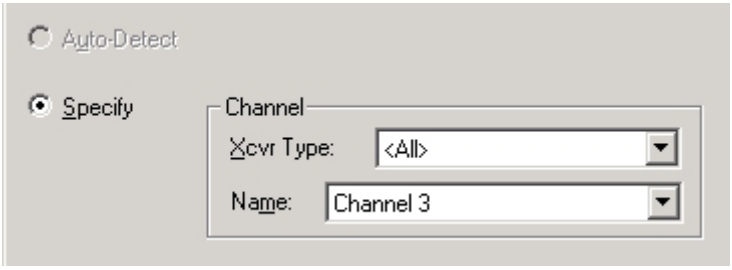


External Interface Definition

For a new type of device, mark *’Load XIF’* and enter the search path for the XIF *File* generated by TAC Menta.

Also specify a suitable *Template Name*. Remember that for Xenta 300/401, and for TAC Xenta 901 with applications missing SNVTs, they will all have the same XIF file. This means the units will have the same *Template Name*, a reason to give it a neutral name.

If you have a unit which uses the same XIF file as one already installed, you select of course *Existing Template* and its *Name.*



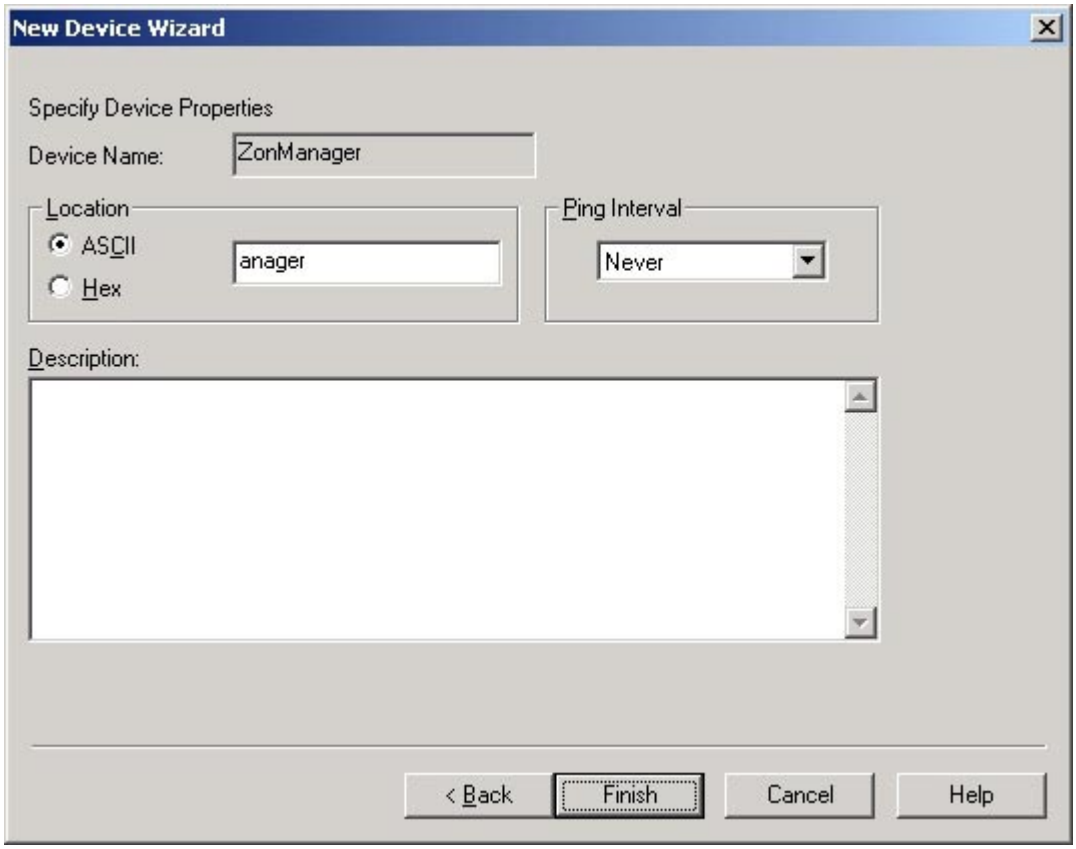
Channel

Check that your installation will be connected to the correct channel.

Device Properties

For TAC Xenta 300/401 with system program version 3.4 or higher, you can specify a “Location String”, that is, the last six characters of the unit name stated in TAC Menta NCT. This will make it easier for LM3 to identify the respective units during the installation procedure.

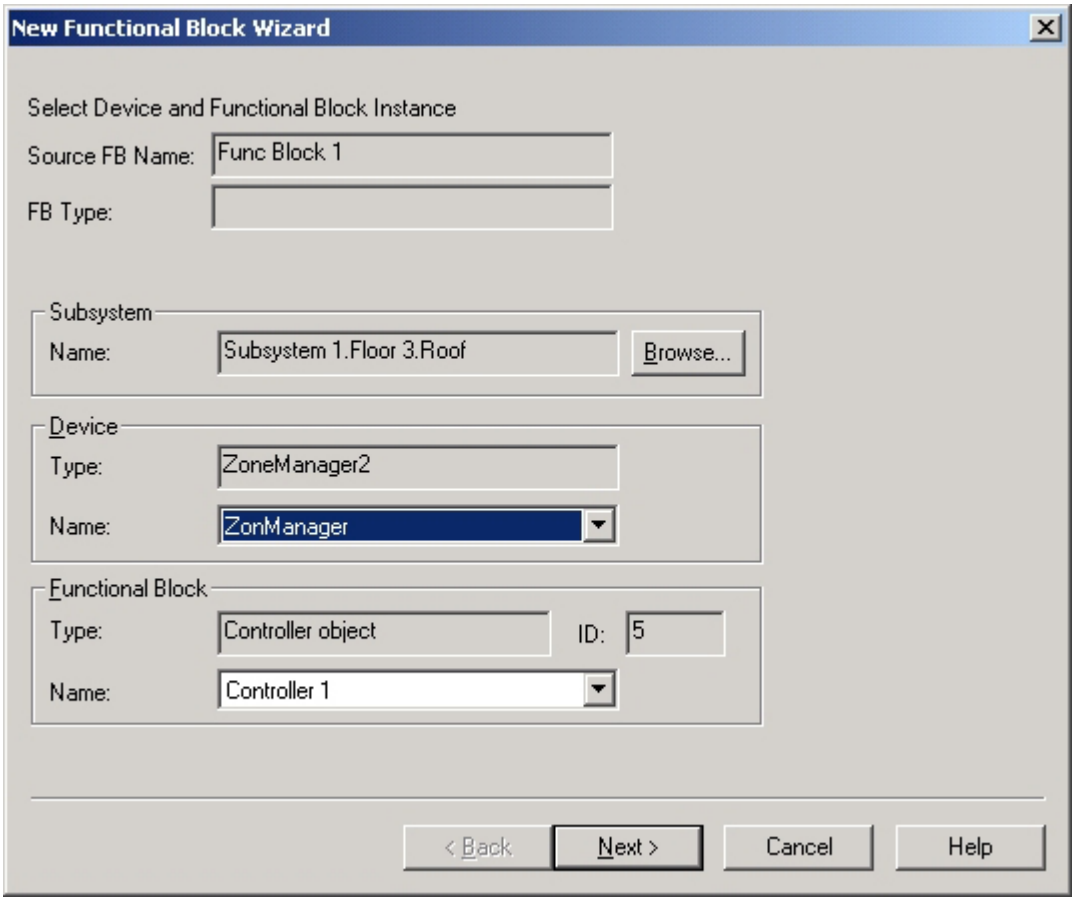
Please note that the TAC Xenta unit automatically will use the last six characters of the unit’s name for the “Location String” and that LM3 will compare the entered text string with the unit’s own string. That is the reason why it is important that the string is entered (*Location*, *ASCII*, below) exactly as it appears in the NCT.



Functional Blocks

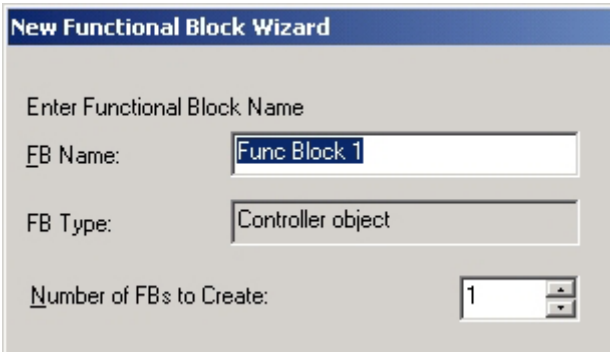
Use “Drag and drop” to add functional blocks for the TAC Xenta 300 units to the drawing.

The free programmable ‘Devices’ have no ready-made function blocks; in stead you will have to use the general functions of LM3. Drag a *Functional Block* to the drawing and you will start the *New Functional Block Wizard.*



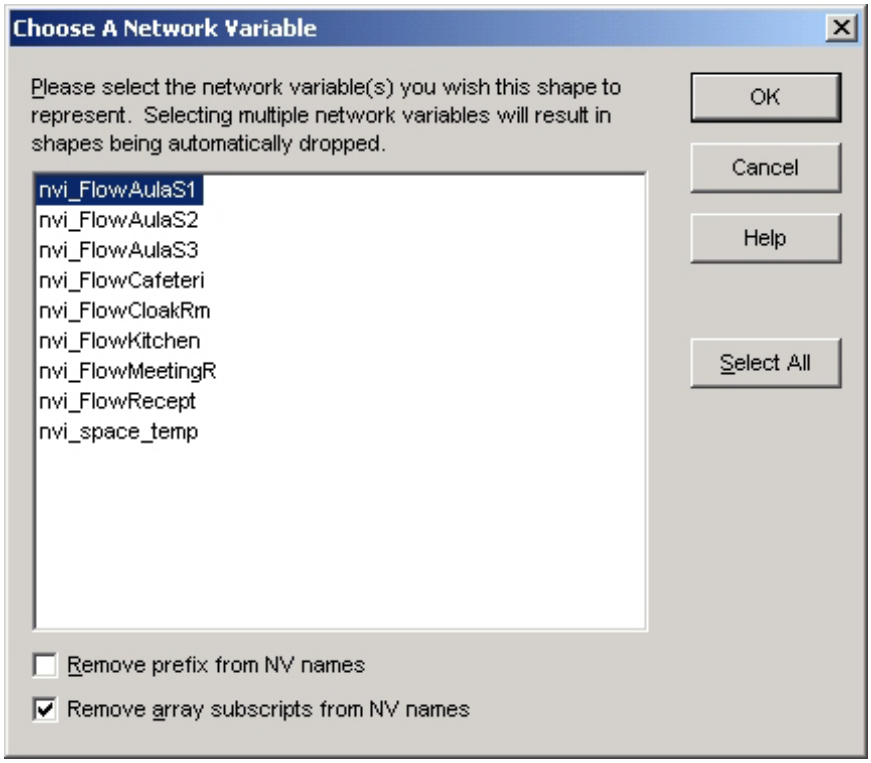
Check that the function block that you add, indicates the correct unit: look in the *Device* box, the *Name* field.

As TAC Xenta 300/401 has all its network variables in the Controller object you must also check that in *Functional Block*, the field *Name* specifies the *Controller 1* object.



As we, when creating the network, checkmarked *Include device name in default FB name*, we can use the suggested name of the function block, *FB Name*.

Use the general functions of LM3, select *Input Network Variable*, or *Output Network Variable*.



Now you either select only those variables that you will use for bindings, or you save trouble (and time) by clicking on *Select All*.

In order to create the TAC group and the **TAC Xenta groups** you have to add Functional Blocks of the type *Virtual Functional Block*. This is done in the same way as before, although you do not have to define any network variables.

4.3 TAC Xenta I/O modules: Units with Shapes

Use “Drag and drop” technique to put the TAC Xenta I/O modules on the drawing.

There are ready-made units, select the respective TAC Xenta I/O module; the remaining procedures are the same as for TAC Xenta 300/401.

As there are no network variables in the TAC Xenta I/O modules, you do not have to add any functional blocks for these.

4.4 TAC Xenta OP: Unit with Shape

Use “Drag and drop” technique to put the TAC Xenta Operator panel on the drawing.

There is a ready-made unit, the rest is the same as for TAC Xenta 300/401.

As there are no bindings to the TAC Xenta OP you do not have to add any functional blocks.

4.5 TAC Xenta 901: Device unit

Use “Drag and drop” technique to put the TAC Xenta 901 unit on the drawing.

There is no ready-made unit: handle according to TAC Xenta 300/401. As it is not possible to make bindings to TAC Xenta 901 no function block is needed.

TAC Xenta 901 has the same program ID as a Xenta 300/401 with an application without SNVTs. So, in those cases where a Xenta 300/401 is already installed, you may get a message that the corresponding *Device Template* already exists. This has no adverse effects, but shows that this type of *Device Template* should be given a neutral name (please refer to en earlier section of this chapter, concerning TAC Xenta 300/401).

4.6 Entering the Neuron ID/Location String

Neuron ID If the *Neuron ID* for network nodes (TAC Xenta or others) are known, these may be entered in advance, without connecting the nodes or installing them on the network.

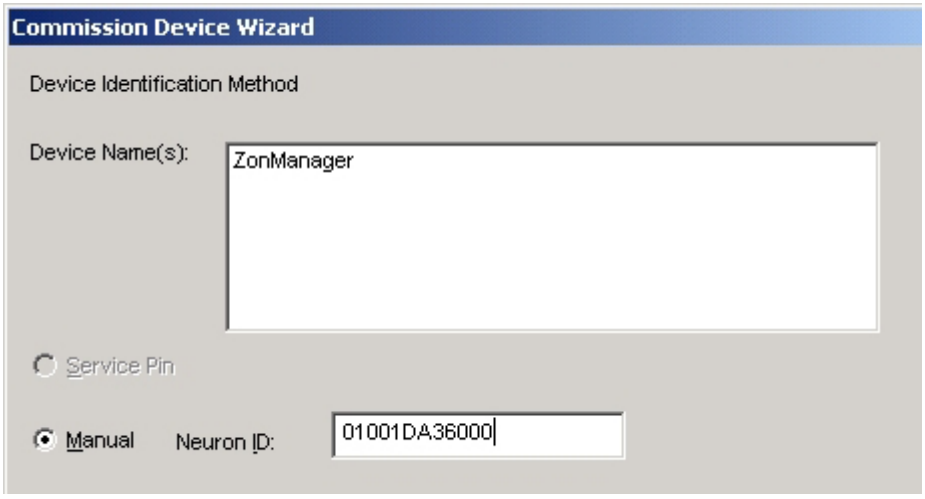
Location String For TAC Xenta 300/401 with system program version 3.4 or higher, in stead of the Neuron ID you can already in the **Device Properties** (section 4.2) specify a *Location String* to identify the respective units.

Please note that it is the last six characters of the TAC Xenta 300/401 which are used as 'Location String'.

Entering the Location Strings or the Neuron IDs in advance will facilitate the commissioning.

'Engineering Mode', that is, not connected to the network

Right-click on the unit and select *Commission ...* .
(Should a warning *Offnet* appear, it can be clicked away.)



Enter the current Neuron ID using a bar code reader or the PC keyboard.

'Ad hoc Mode', that is, connected to the network

To enter the Neuron ID without installing the node (presently) you select from the tool bar **LonMaker - Network Properties**, click on the sheet *Onnet/Offnet* and specify *"Offnet"*.

Now right-click on the unit, select *Commission ...* and enter the Neuron ID according to the example above.

Finish the procedure by returning to the *Onnet/Offnet* sheet and specify *"Onnet"* again.

5 Step-by-step: Bindings

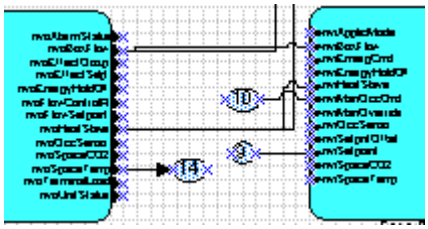
5.1 Binding by Connector or by Reference

There are different ways of arranging the binding.

- Use *Connector* to make a direct connection between the corresponding input and output signals.

  However, this works only when binding between function blocks situated on the same page.

- Select two or more function blocks (click on the first, then keep the *Shift* bar pressed when clicking on the rest), click right, select *Connect…* .
  In the right part of the window you can now mark *Graphics - Normal* or *Graphics - Use References*.



Normal means that you will get a line drawn between the function blocks (recommended within the same page).

References means that you will get a number referring to another position in the network, where you will find the same number. This pair of numbers may be altered to a designation of your own choice.

References are always used when the function blocks reside on different pages.

As we already have split up the network into a number of pages, we recommend the latter method. If the binding lies within the same page use *Normal*, otherwise *References*.

5.2 TAC and TAC Xenta Groups in LM3: Group binding

All TAC Xenta units in a network know the unit names of their own TAC Xenta group and of the other group names.

All TAC Xenta units belong to the *TAC group* with a special group address. Communication from TAC Vista and the transmission of TAC NV values between units of different TAC Xenta groups occur using this group address.

The transmissions of TAC NVs between units of the same TAC Xenta group use the respective *TAC Xenta group* no. Also the TAC OP uses these group addresses.

To build the TAC group, you must perform a binding between all TAC Xenta 300/401 units of the network.

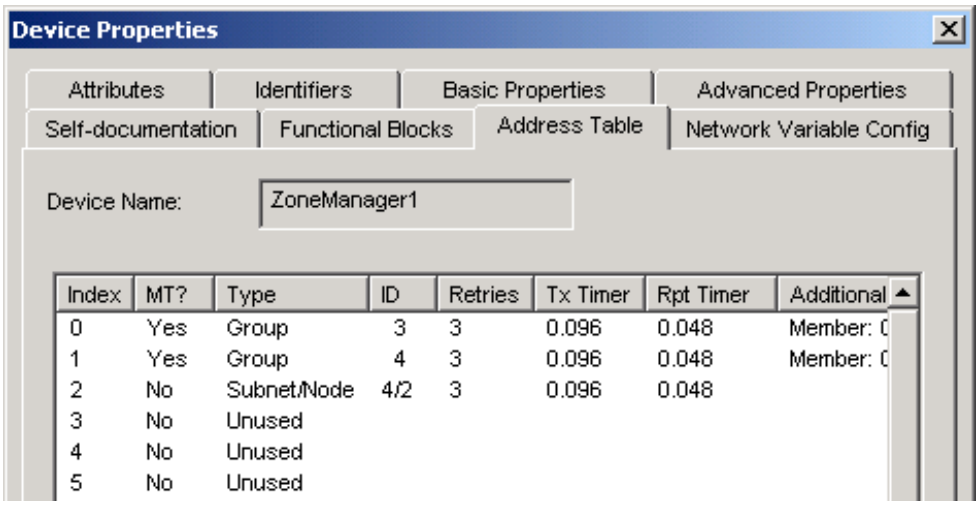
To build a TAC Xenta group, you must perform a binding between all TAC Xenta 300/401 units of that group.

Note! TAC groups and TAC Xenta groups must not be in 100% accordance with each other. Should this be the case, you must add a dummy node to one of the groups, in order to produce two different group bindings. This dummy node must be of the TAC Xenta 300/401 type.

The first group binding gets group address 0, and then in ascending order. In order to determine which address a group binding will get, you must see to that this binding is made first of all.

In practice, this may be difficult to achieve, so to find out which group addresses the bindings received, you can do as follows.

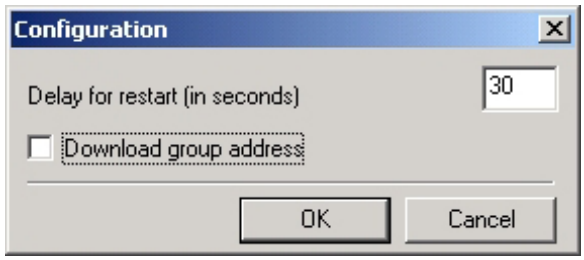
If you click right on a unit in on-line mode and select **Device Properties** you can under the header **Address Table** see the address table of the unit, containing information about messages to and from the unit. In the column *ID* you will find the current group address for the binding.



In TAC Xenta 300/401 index 0 is reserved for the TAC group, while index 1 is reserved for the TAC Xenta group.

Had the TAC group been the first group binding performed in the LonMaker project (*tag_0*), this binding would have got group address (’*ID*’) 0. In the example above the TAC group received group address 3.

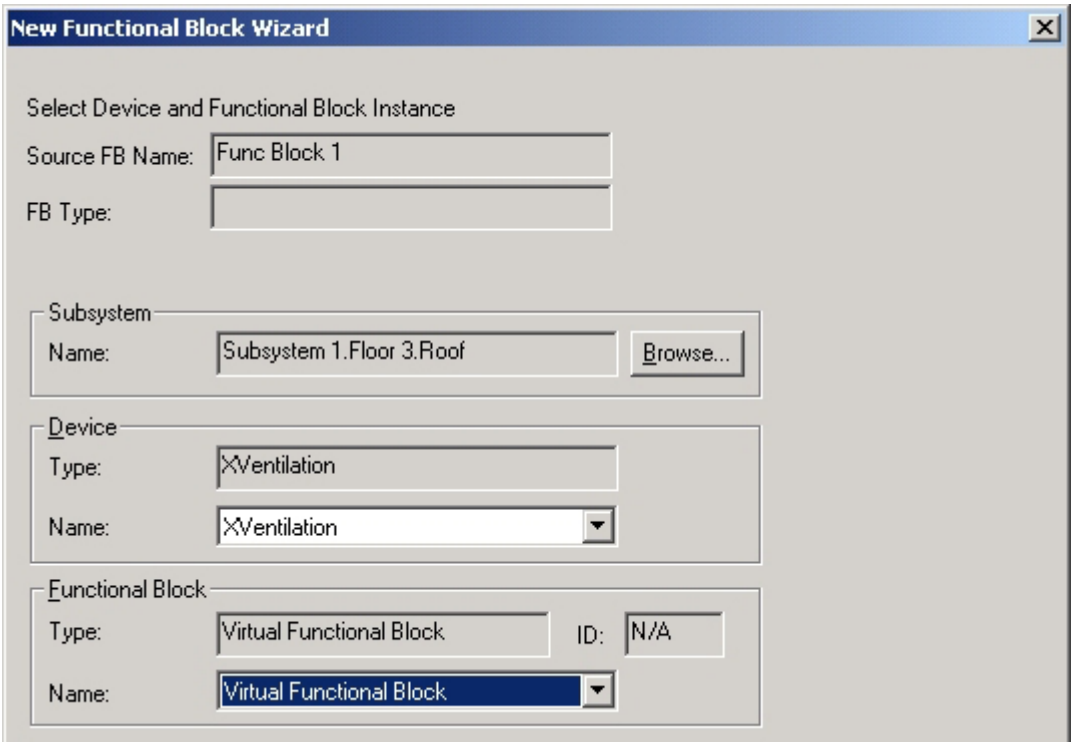
To protect these group addresses during work with TAC Menta NCT, there is in TAC Menta NCT, under **Alternatives – Settings**, a check-box *Download group addresses*. Deselect this box in order to leave the group addressing to LM3.



Bindings for the TAC Group

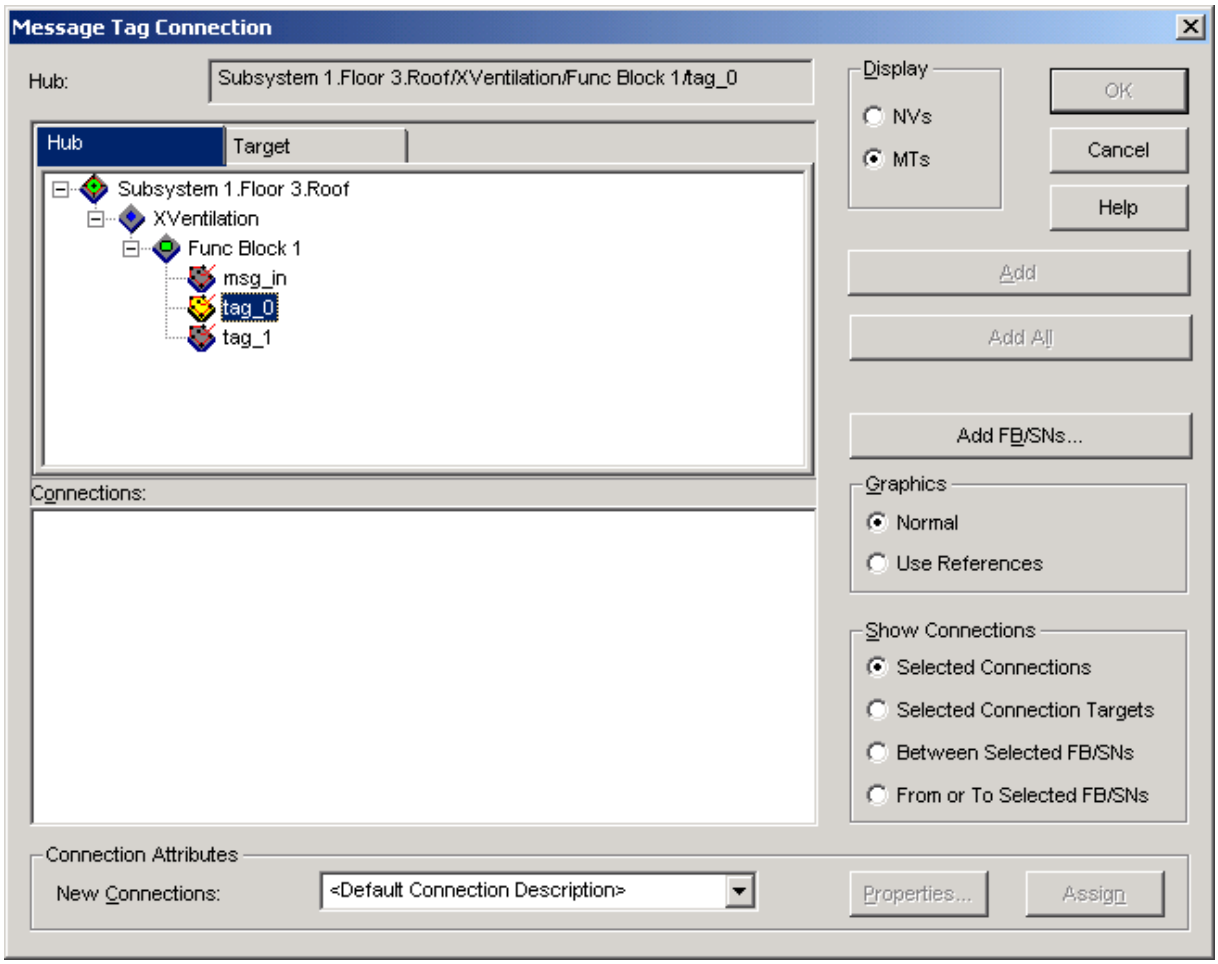
Bindings to crate the TAC group are made in the following way.

Add a virtual Function Block to all TAC Xenta 300/401 units:



Select the virtual Function Blocks, right click and select *Connect* … .

Point on any *Hub* and the variable *tag_0*. Select *target*, specify the same variable, *tag_0*, for all TAC Xenta 300/401 units of the network.



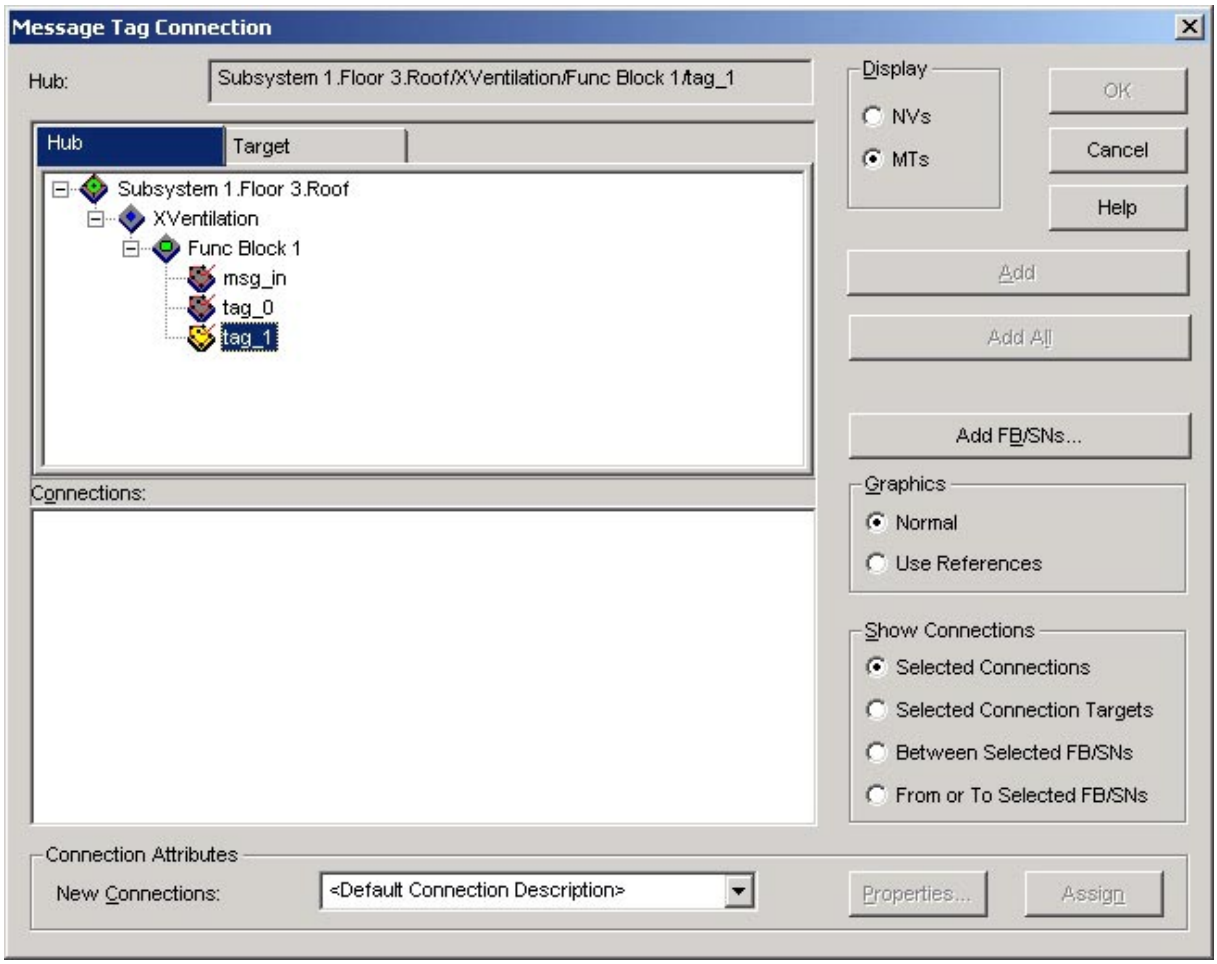
As this binding was the first made in this network, it was assigned group no. **0**. Specify this in TAC Vista.

Bindings for the TAC Xenta Groups

Again select the virtual Function Blocks, but this time only to bind the units of the first TAC Xenta group.

Rightclick and select *Connect … .*

Point to a *Hub* (preferably the Group master) and the variable *tag_1*. Then select *Target*, specify the same variable, *tag_1*, for all TAC Xenta 300/401 units of the first TAC Xenta group.



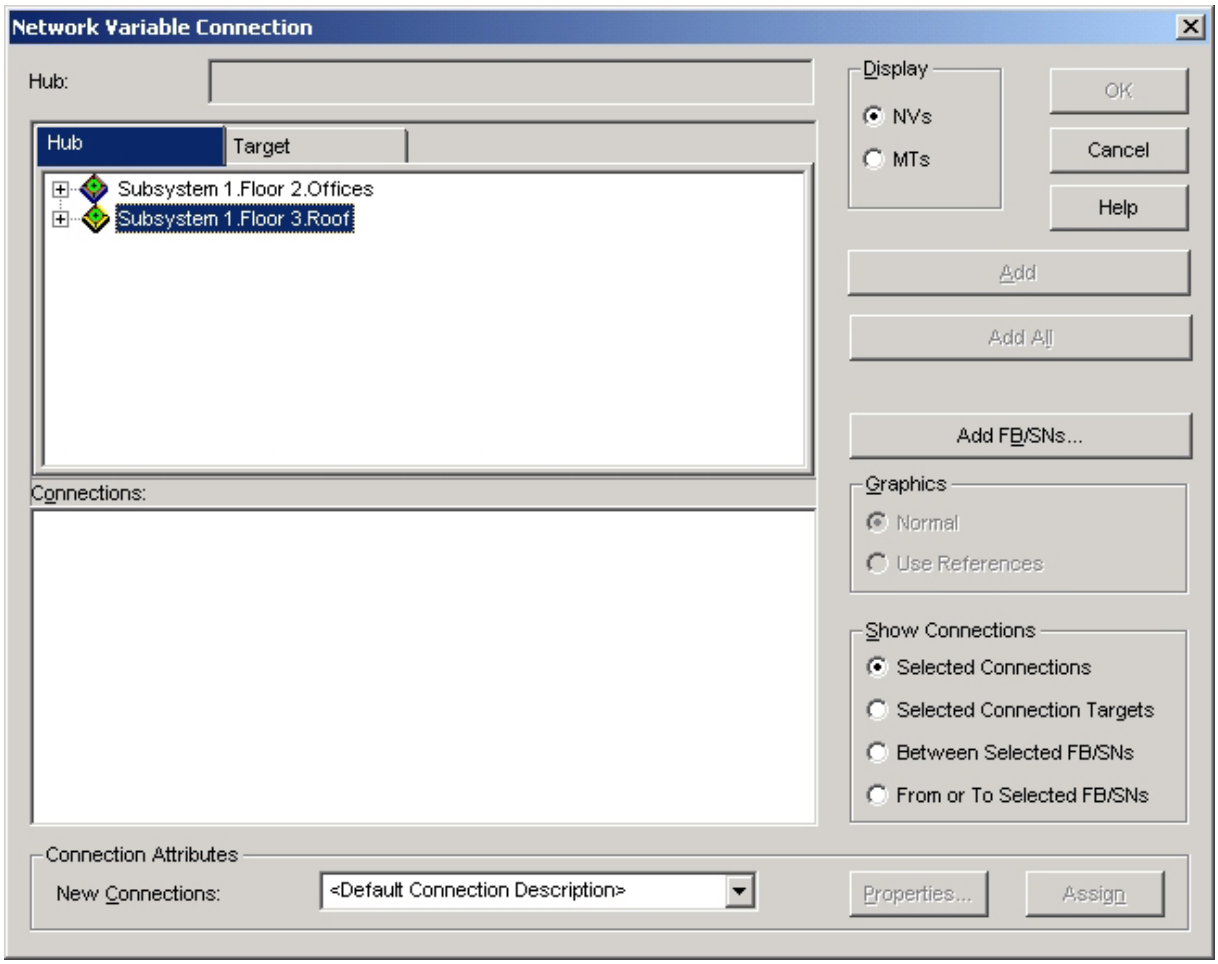
Repeat the procedure for all TAC Xenta groups.

Note! At least three nodes are required to produce a group binding; otherwise you have to add a dummy unit.

5.3 Bindings between the Function blocks

Point out those *Function Blocks* that you are going to bind by rightclicking on them and then select *Connect ...* .

If there are several in the same window, then click on the first, keep the *Shift*-key pressed when you click on the next Function Block. Rightclick and then select *Connect…*



Are you going to bind a signal between more than two units? First find out which end will be single, that is, will you send one-to-many or many-to-one? This will determine which is *Hub* and which is *Target*.

Hub is the single end, select the correct *Subsystem* - *Device* and *NV*.

Under *Target* you select the corresponding *Subsystem*, *Device* and *Functional Block*. At *Target* only *NVs* of the correct type will appear, that is, the same types as selected for *Hub*.

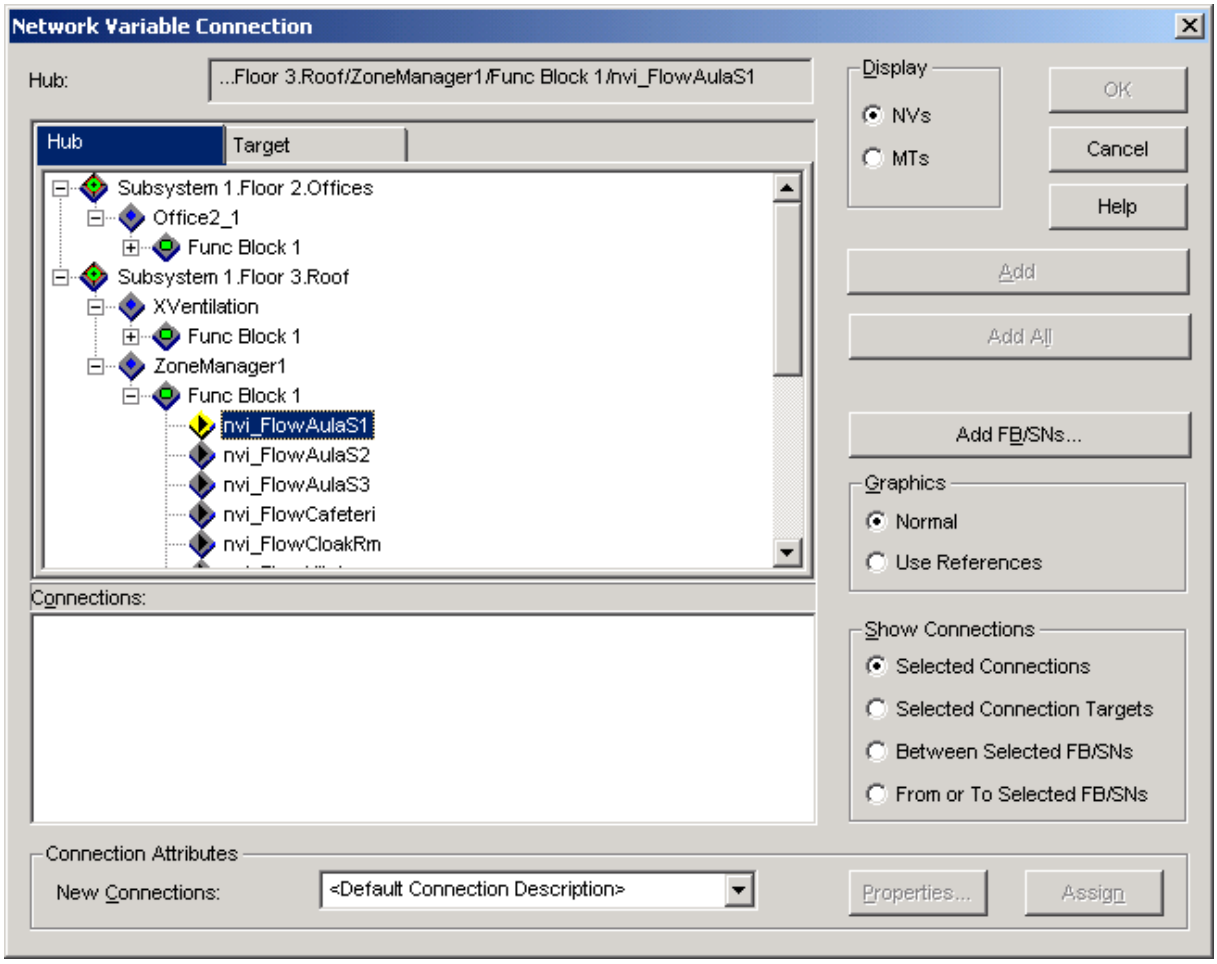
Click on *Add* to add the binding. If necessary, select a new *Target* to bind the same signal to more units. Do not forget to *Add* each new one.

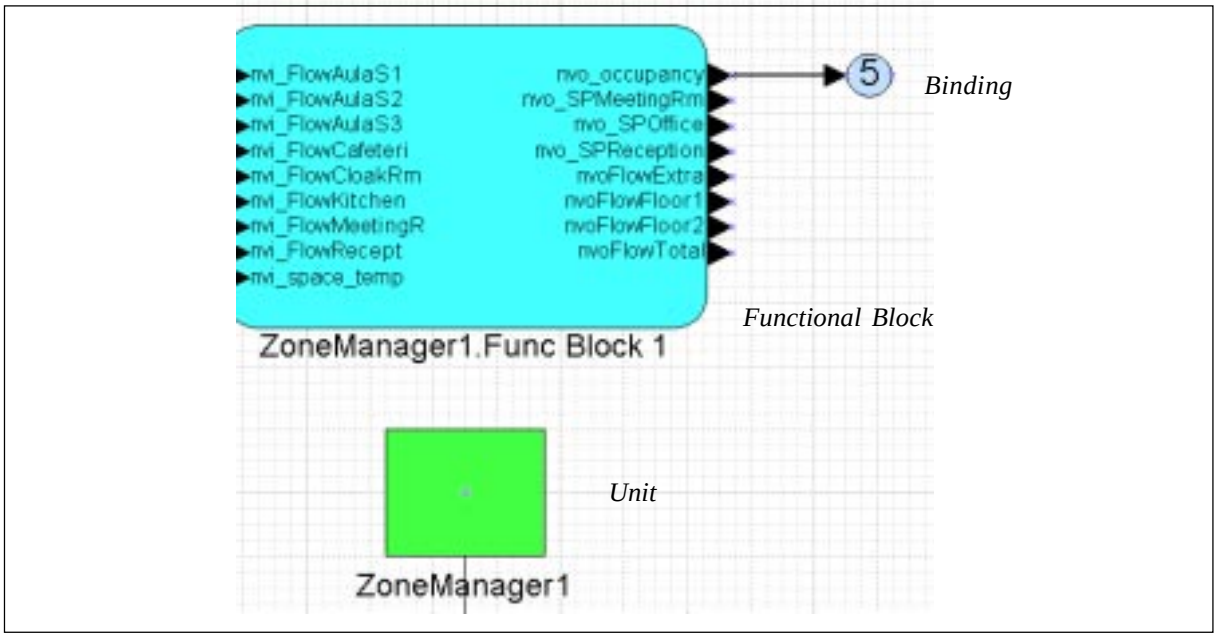
If you select a signal and click on *Add All* the corresponding binding will be made for all the selected units to NVs that have that same name. Do not forget, however, to check under *Connection* that the correct signal was selected, before you apply the binding by clicking *OK*.

If the bindings appear on the same page you may use *Graphics - Normal*.

If the units reside on different pages, the binding will automatically be done using references (’*Use References*’).

Did you miss some nodes that also were to receive the same signal? Then click on *Add FB/SNs* and select the specific Function Blocks; now checkmark those Function Blocks.





The result after the binding

5.4 Sending to several nodes using only one line of the address table

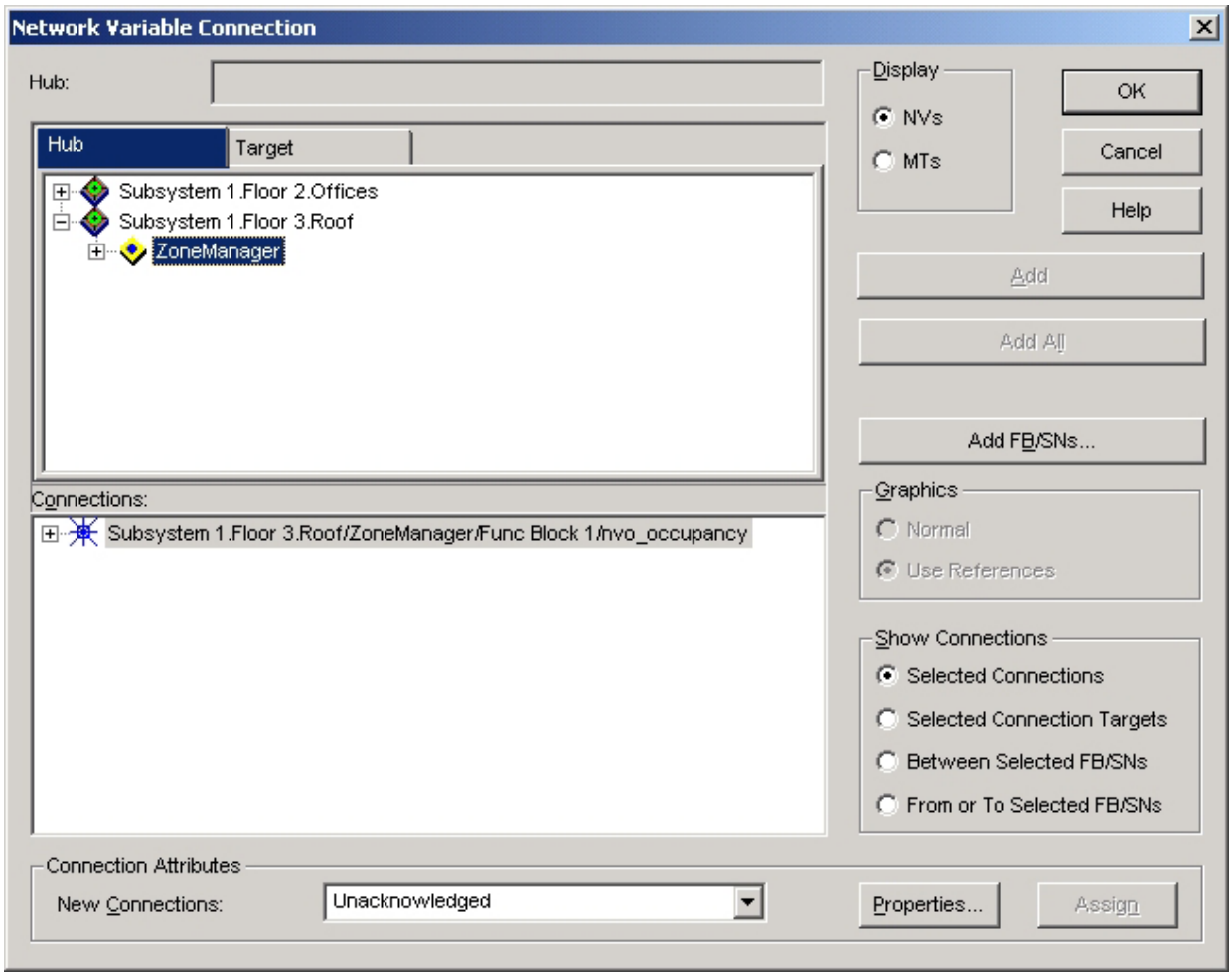
Normally one line of the address table is used in the sending node for each receiving node or group that you wish to send to. As there are no more than 15 table lines (at the most) for each node, you will soon run out of address lines even in small-sized networks. If you need to send more messages, you may in LM3 create a special type of binding, using the so called broadcast message.

Characteristics for this type of messages are:

- Only one address (the subnet address) is used in the sending node, in spite of the fact that the transmission is for several nodes.
- Message acknowledge cannot be requested.
- It is not possible to identify the receiving nodes, using a line analyzer.
- The message is a broadcast message, meaning that every single node listens. The message is then ignored by nodes that do not belong to this binding.
  This means that a broadcast requires a larger bandwidth than a normal binding.
- If the broadcast crosses several Subnets, it may become a Domain broadcast, reaching the whole network.

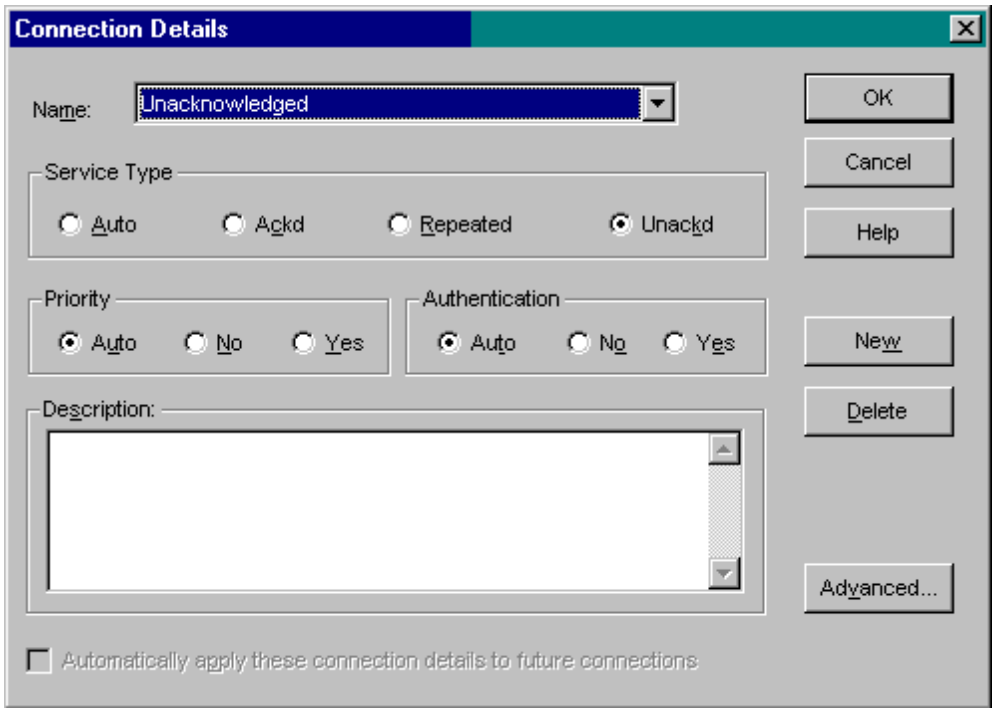
Working method

1 Choose those nodes between which you wish to bind, rightclick and select *Connect…* .

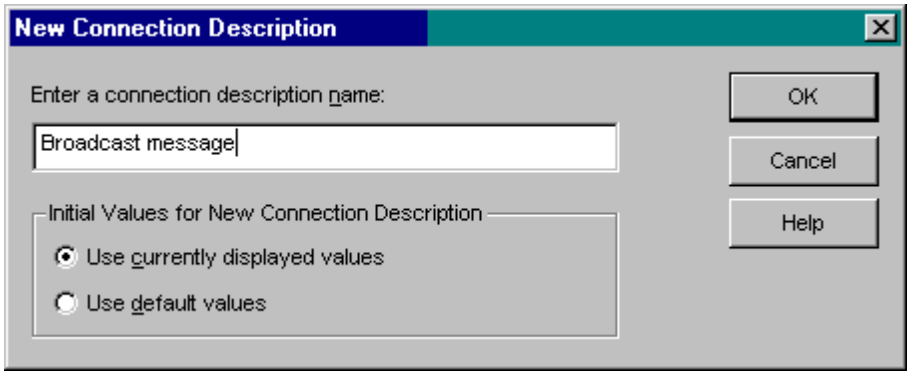


2 Under *Connection Attributes*, *New Connections*: select *Unacknowledged*.

Click on the *Properties* ... button.

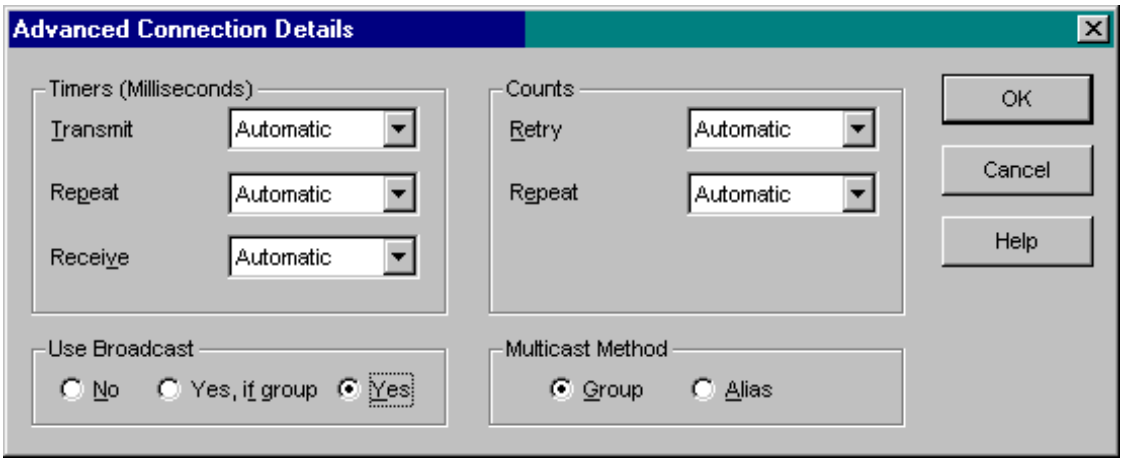


3 Select the *New* button.



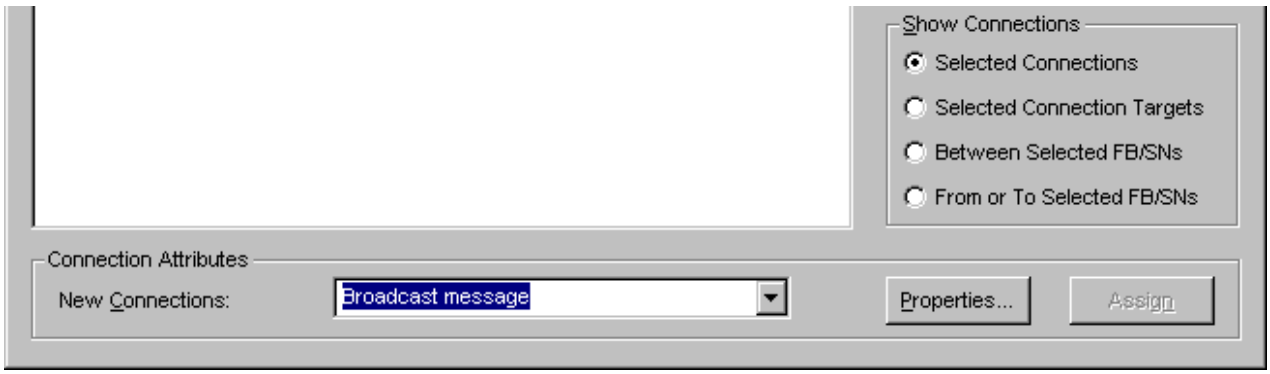
4 Assign a name to the new binding type, click *OK*.

5 Then click on the *Advanced ...* button.



5 Under *Use Broadcast*, select *Yes*, click on *OK*.

Back to the **Network Variable Connection** window, you select the new binding type under *Connection Attributes, New Connections*: .



6 Pick out *Hub* and *Target* in the usual way.

When the new binding type has been created, you can henceforth select it under *Connection Attributes, New Connections*: .

6 Installation of the Units

6.1 Network Interface and Routers

Now that we have designed the network, it is time to physically install the units, that is, all units are to be connected and given their address.

Depending on the extent of the network, it may be more convenient to bring along the PC with the database to the site, treating one area at a time.

If the PC with the LNS Network Interface is to be temporarily connected to any other *channel* apart from the original, you must specify so in LM3. In this case you may either move the LNS Network Interface symbol to the drawing with the intended channel, or let the system redraw the intended channel connection in the page where the LNS symbol already resides.

Procedure

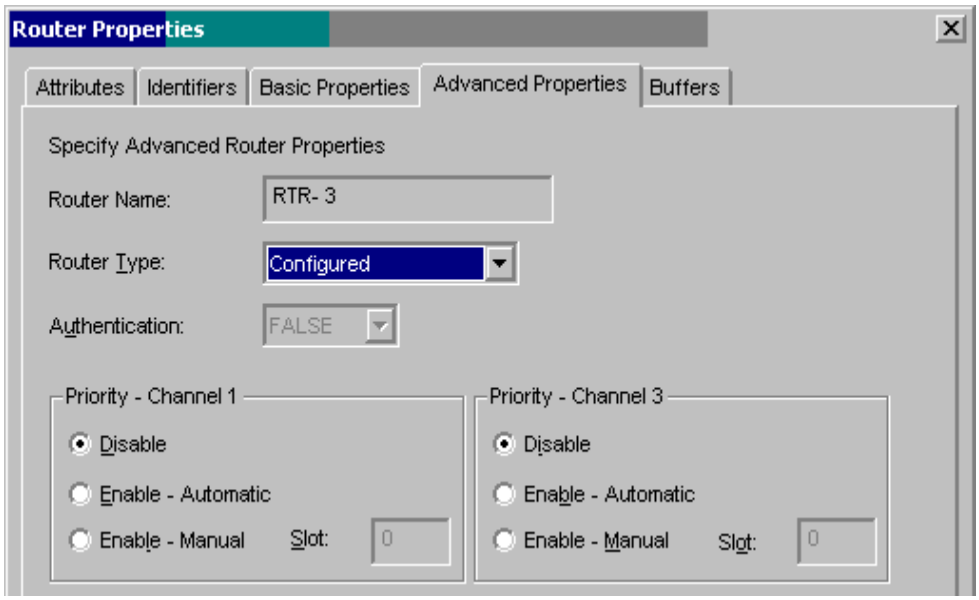
Leave LM3; move the commissioning PC to the new channel and reopen LM3. Make sure that '*Network Attached*' is indicated (normal case during commissioning).

Click right on the LNS Network IF symbol and select *Change Channel ...* .

Enter the items for the intended destination and confirm that the PC has been moved, in the *Move devices and routers* window.

If the routers are missing at this stage, or if you do not wish to install them right now, then specify them as *Repeaters*, otherwise you will get no contact between the channels.

Click right on the router, select *Properties…*



Under the tab *Advanced Properties* you will find the settings for the type of router you have got.

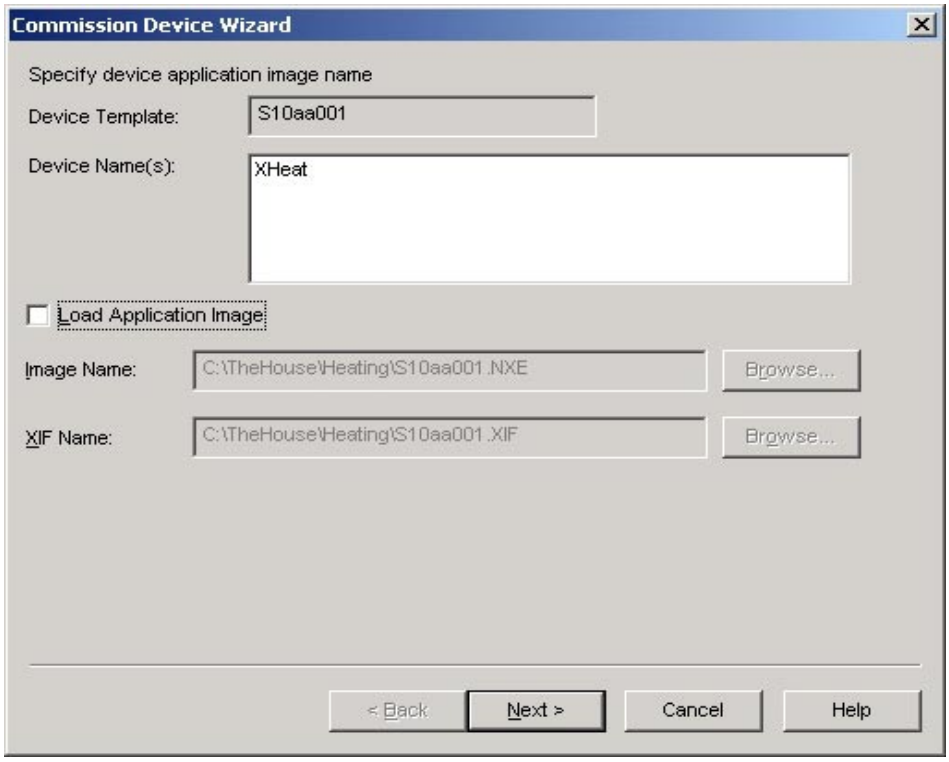
6.2 The TAC Xenta units

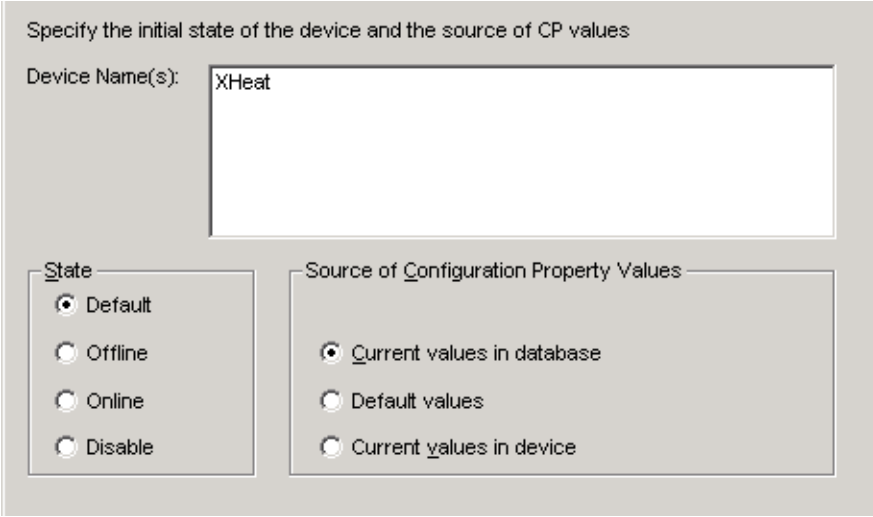
6.2.1 One unit at a time

If you are to install occasional units, then open the subsystem where the unit is defined, click right on the unit and select *Commission*.

As the TAC Xenta units are Host-based, that is, the application does not reside in the neuron but outside, you are not to download the application via the network management tool.

Note! Consequently, do ***not*** checkmark the *Load Application Image* box.



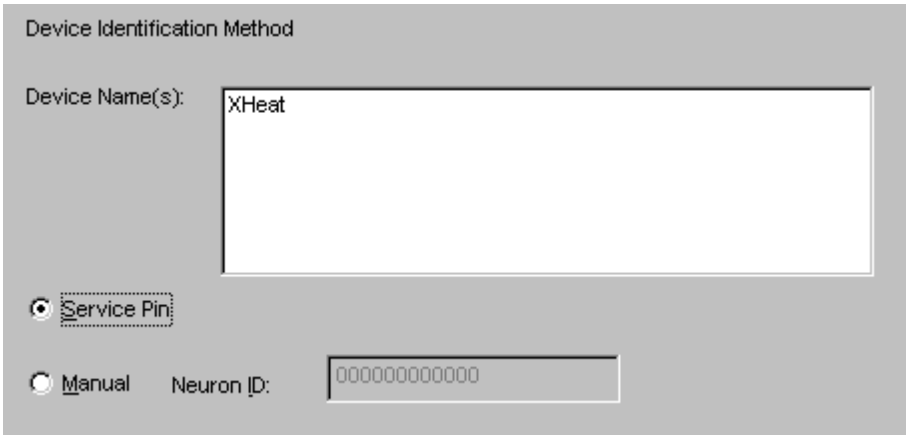


State

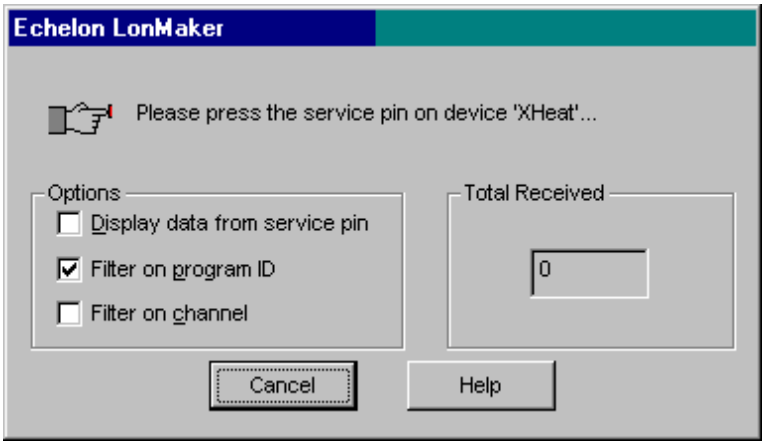
Determine what *State* the unit should have directly after the installation.

Also specify which values are to used (here: *Current values in database*).

As we chose On-line when creating the network, we do not have to set this for each unit.



Determine what procedure you are going to use, *Service Pin* or a *Manual* value of the *Neuron ID.*



Now we have to press the *Service pin* on the proper unit.

(Unless you selected the manual neuron ID entry; then the service pin will not be used!)

6.2.2 Several units together

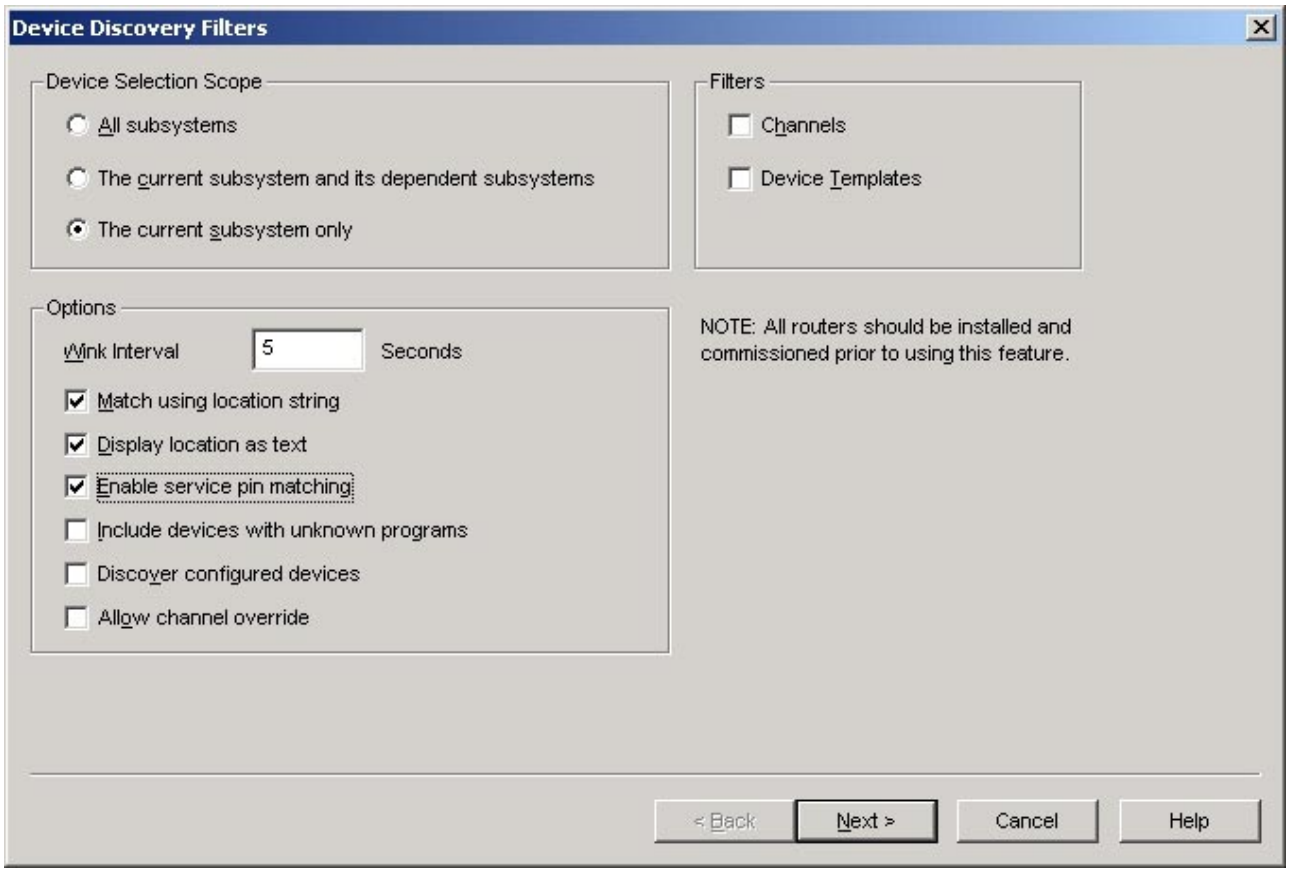
If you select several units and then rightclick and use *Commission*, all the selected units will be installed in the way described above.

Another method is described below.

The principle is to install one channel at a time. It may be convenient to bring the PC to the selected channel, in order not to work against the whole network. How to move the Network interface has been described earlier in this chapter.

If you have unique units, that is, each unit has a unique program ID, test the *Auto Match*; then you will not even have to look up the units! The same holds true if you specified the *Location String* when you added the nodes to the drawing file (valid for TAC Xenta 300/401 with system program version 3.40 or higher).

Go to the current Subsystem. Select *LonMaker - Discover Devices …*



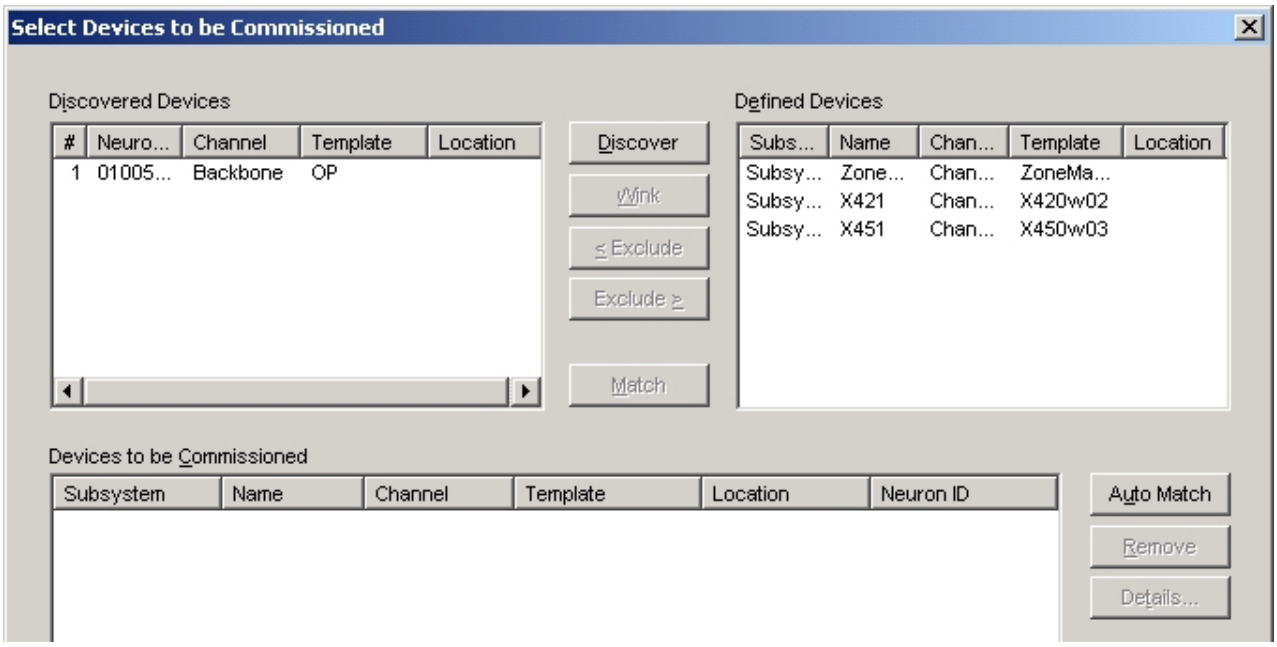
Device Selection Scope

Decide if you want to work with *The current subsystem only* or *The current subsystem and its dependent subsystems*.

If the units reside on the other side of a repeater (or a Router configured as a repeater), you may in Options have to checkmark the box *Allow channel override*.

Options

Checkmark the boxes *Match using location string*, *Display location as text* and *Enable service pin matching*.



Provided that the units have unique Neuron IDs and/or *Location Strings*, your pressing **Auto Match** will cause the program to move the identified units down to the window *Devices to be Commissioned*.

Defined Devices

Choose a unit in the list *Defined Devices*, by clicking on the *Subsystem* of the respective unit.

After that, you press the Service pin of the corresponding unit. The unit will now move down to the list *Devices to be Commissioned*.

This will select the nodes sequentially as you press Service Pin. Note the order of the units in the list and then seek out to the respective units (in the same order!) and press Service Pin.

Check that you have matched the correct unit with the corresponding Neuron ID before you click **Finish** and the units will be installed.

6.3 The need for the TAC Menta Configuration tool

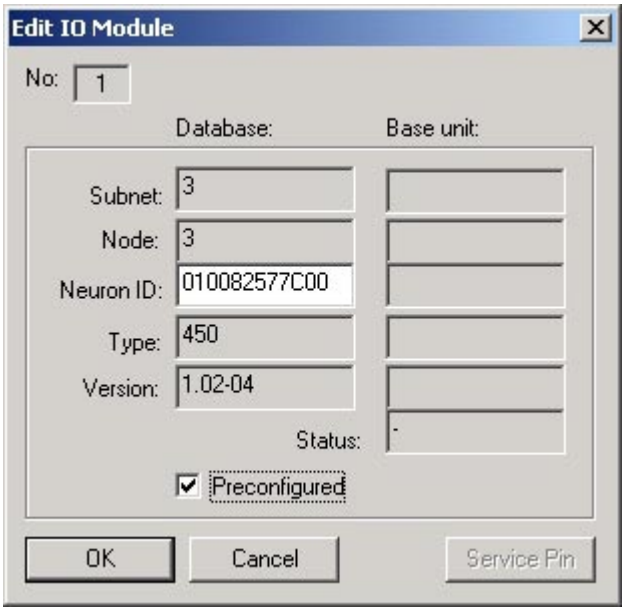
In the TAC Menta network configuration tool (sometimes called *TAC Menta NCT*) there is an option to specify if an external binding tool will be used at the installation of the units.

– If this has *not* been marked (that is, *no* external binding tool will be used) TAC Menta NCT will copy the subnet/node addresses from the application domain to the zero-length domain. Thus, TAC Xenta will get the same subnet/node address in both the application and the zero-length domain.

– If there is a checkmark (that is, an external binding tool *will* be used) no addressing will be done on the zero-length domain, that is, TAC Xenta will only listen on the application domain.

Please note that in TAC Menta NCT the 'Binding tool used' is specified per I/O module, under the label *Preconfigured*.

Checkmarking the *Preconfigured* box means that TAC Xenta will *not* set the address of the I/O module.

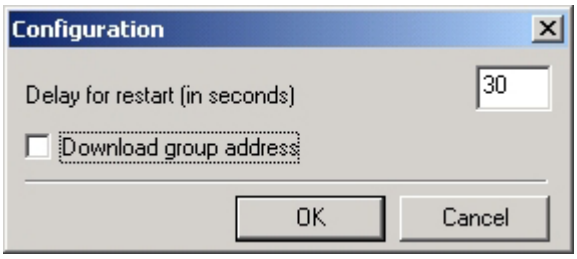


TAC Menta NCT is also used to set the *group addresses* of TAC Xenta, both for the general TAC group (default 51), and for the respective TAC Xenta groups, (default value starting with 16).

When configuring TAC Xenta with LM3 you have to create the TAC group by creating bindings between all the TAC Xenta 300/401 units of the network and, for the TAC Xenta groups, a binding between all TAC Xenta 300/401 units of the respective groups.

In this case the group addresses will reside in the LNS data base and they will be transferred to the nodes at the installation.

Please note that you must specify in TAC Menta NCT that the group addresses are **not** to be down-loaded. Otherwise you may risk an address conflict.



Also the TACNV messages are affected by the group addressing.

If you install the units with TAC Menta NCT before you have used LM3, you can start by setting the addresses in TAC Xenta 300/401 and the I/O modules. This is done in the usual way in TAC Menta NCT. (LM3 will use a whole set of different address values, but this is no drawback and will help us avoid address conflicts at a later stage.)

Try to use high subnet values, to minimise the risk of having the same subnet number on both sides of a router.

Checkmark the '*Binding tool used*' and the '*Preconfigured*' boxes for the respective I/O modules. Uncheck the '*Download group addresses'* and perform another download.

The TAC Xenta units and their I/O modules are now set up to be used in the network.

After an installation with LM3, a restart of the TAC Xenta is sufficient for it to get in contact with its respective I/O modules.

6.4 Special actions for the TAC Xenta units

6.4.1 TAC Xenta 300/401

- TAC Xenta 300/401, whose applications do not use SNVTs, always have the same program ID and so, the same XIF file. (Also used by 901.)

- TAC Xenta 300 hardware type 1 will incorrectly get the same XIF file from TAC Menta as hardware type 2.

  As hardware type 1 has another type of Neuron, which cannot be installed in a correct way, hardware type 1 must never be used together with LM3.

6.4.2 TAC Xenta 400 I/O modules

- When TAC Xenta 300/401 is installed using LM3, it is not possible to address the I/O modules in TAC Menta NCT using the Service pin, as this message is sent on the zero-length domain.

  This means that you have to enter the Neuron ID manually when installing an I/O module in TAC Menta NCT.

  However, if the TAC Xenta 300/401 has not yet been installed with LM3, the Service pin method will work.

- If you wish to program the network off-line, all XIF files must be available.

- Different versions of the I/O modules have different program IDs. To match the XIF files with the modules, when designing your network off-line, you must know which version is used in the respective I/O modules.

6.4.3 TAC Xenta OP

How the TAC Xenta OP is treated depends somewhat on the program version. Starting with version 3.32 the OP Service menu has been changed:
`Mode = TAC/INST/MAN` has replaced `Bindable = OFF/ON`.

`Mode = INST` or `Bindable = ON`,
nci_config_src = **1** (CFG_EXTERNAL)

When TAC Xenta OP is installed in LM3 the variable *nci_config_src* will be switched from 0 (=CFG_LOCAL) to **1** (=CFG_EXTERNAL).

- TAC Xenta OP is addressed using LM3, which means that it must be mounted permanently in a cabinet or similar.

  It ***must not*** be moved around in the network, as you then may risk that the OP with its old subnet number will be put on another channel. The same subnet number must ***never*** appear on both sides of a router, as the router then will stop communicating.

- You cannot use a permanently installed OP with the TAC Xenta 100 units, as the TAC Xenta 100 unit will send out a "Service pin" message when the OP is connected electrically to it. This is done in order to find out which unit the OP communicates with. As the OP does not belong to the zero length domain no contact will be established.

  When the OP is connected electrically to a TAC Xenta 100 unit, the OP will first wait for the operator to press 'Enter'; if none appears the OP will start looking for a TAC Xenta 300/401 as a server. However, this request will be sent on the zero length domain. As the units of an LNS network are only installed in one domain, no unit will answer and the OP will show "No Answer".

`Mode = TAC` or `Bindable = OFF`,
nci_config_src `= 0 (CFG_LOCAL)`

This mode requires that the TAC Xenta OP has *not* been installed with LM3, which means that the variable *nci_config_src* is not affected.

This is the only mode that can be used when TAC Xenta OP is to communicate with a TAC Xenta 100.

- TAC Xenta OP will now get its address from a TAC Xenta 300/401, meaning that you always have to reserve the two succeeding node addresses of a TAC Xenta 300/401. This is done when you build the network by adding two dummy nodes each time you have included a TAC Xenta 300/401, letting the dummy nodes get the addresses immediately after.

- Always check the addresses when you have changed application in a TAC Xenta 300/401, or when units have been replaced.

TAC Xenta OP may now be moved around in the network, as it will get its address from a TAC Xenta 300/401.

However, the great disadvantage with this procedure is that

– You have to enter two dummy nodes directly after each TAC Xenta 300/401.

– You have to check addresses when changing application in TAC Xenta 300/401 as LM3 may assign the unit a new Subnet/Node address.

– You have to check the addresses when replacing TAC Xenta 300/401 units, as LM3 may assign the unit a new Subnet/Node address.

– Before the TAC Xenta OP gets its address from a TAC Xenta 300/401 unit it will automatically belong to the zero length domain. When OP is electrically connected to a TAC Xenta 100 unit, the OP will wait for the operator to press 'Enter'; if none appears the OP will start looking for a TAC Xenta 300/401 as a server. This request will be sent on the zero length domain. As the OP in this case belongs to the zero length domain communication can now be established between TAC Xenta OP and TAC Xenta 100.

`Mode = MAN` (Only for TAC Xenta OP version 3.32 or higher)

This mode requires that the TAC Xenta OP has *not* been installed with LM3, which means that the variable *nci_config_src* is not affected.

- TAC Xenta OP must belong to the correct domain. As a standard the domain ID 11 (hex) is used and we recommend that you keep to this domain address. The current domain can be set on the TAC Xenta OP in the service menu, item 4 LON address, 00-255. Please note that the 1-byte domain address 00 is *not* the same as the zero length domain.

  When a TAC Xenta OP is connected to the network, it will automatically look for a free address on subnet 255, node 70 or higher. Is no free address available, the OP will fall silent, not to disturb the network traffic. If a node address is available the OP will use it.

  Subnet 255 can be used on both sides of those Routers that TAC has used. Be careful though, as this is not according to standard. Should problems arise, you will have to install the OP permanently as described above.

  If, however, no problems appeared this means that the OP in this mode is movable, without the dummy nodes normally required after each TAC Xenta 300/401.

- An OP in this mode cannot be used for the TAC Xenta 100 units, as the TAC Xenta 100 unit sends its "Service pin" message on the zero length domain, when the OP is electrically connected to it. This is done in order to make sure which unit the OP communicates with. As the OP does not belong to the zero length domain no contact will be established.

- When the OP is connected electrically to a TAC Xenta 100 unit, the OP will first wait for the operator to press ‘Enter’; if none appears the OP will start looking for a TAC Xenta 300/401 as a server. However, this request will be sent on the zero length domain. As the units of an LNS network are only installed in one domain, no unit will answer and the OP will show “No Answer”.

If a TAC Xenta OP is no longer used in an LNS network it must be deconfigured according to the following..

System program lower than 3.32:

- Start the LM3 Browser. Look for *SNVT_config_src* (labelled *var_2* in the browser; with rightclick and *Properties* the name will become visible).
- Reset *SNVT_config_src* manually from 1 (= CFG_EXTERNAL) to **0** (= CFG_LOCAL).
- Check that Bindable = OFF in the Xenta OP Service menu.
- Disconnect the OP electrically.
- Remove the OP from the LM3 data base.

System program 3.32 or higher:

- Check that Mode = MAN in the Xenta OP Service menu.
- Disconnect the OP electrically.
- Remove the OP from the LM3 data base.
- The next time that the TAC Xenta OP is powered up, it will automatically reset *nci_config_src* to CFG_LOCAL.

- If you wish to program the network off-line, you must get the XIF file for the OP (from TARAI or other source).

6.4.4 TAC Xenta 100

- To start up ‘local’ zones, before the network is connected, it is possible to set up the main parameters using the OP. This works only if TAC Xenta 100 has been set up as ‘Configured’.

Note! If you want to keep these parameters at future downloads, you must save them in the data base for LM3 (or TAC Vista).

After the most important parameters have been set (the subnet/node addresses cannot be changed) Xenta 100 must be reset to the ‘Unconfigured’ state. Otherwise conflict will arise with all remaining units which have the same subnet/node address (1/1, factory-set).

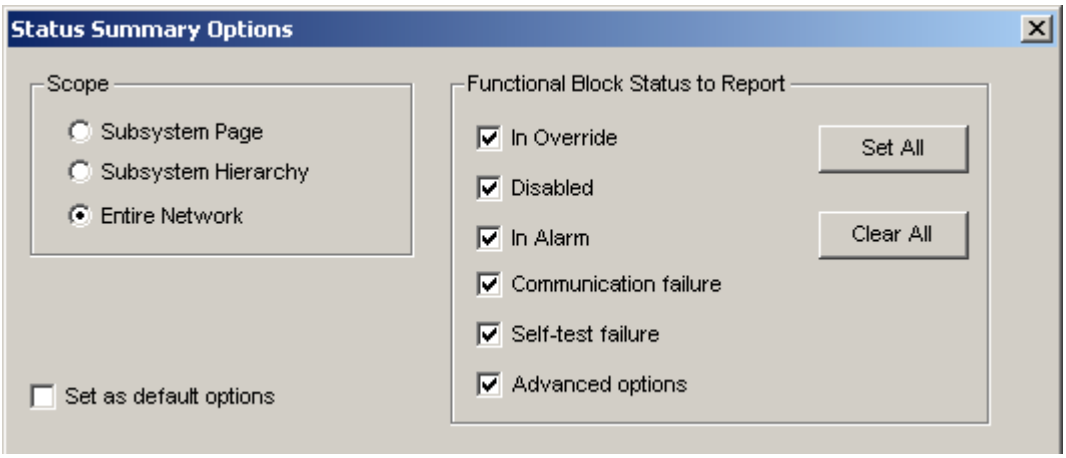
If you get addressing problems already when using the OP, you may set the OP as ‘bindable’, as the communication with TAC Xenta 100 then will use the Neuron ID.

6.4.5 TAC Xenta 901

- TAC Xenta 901 uses the same 'Device Template' as TAC Xenta 300/401, with no SNVTs in the application. Therefore, you may be asked if you wish to rename the Device Template file, when adding a unit. As it should be easy to detect which unit uses which Device Template, your answer will depend on the circumstances.

6.4.6 Status Summary

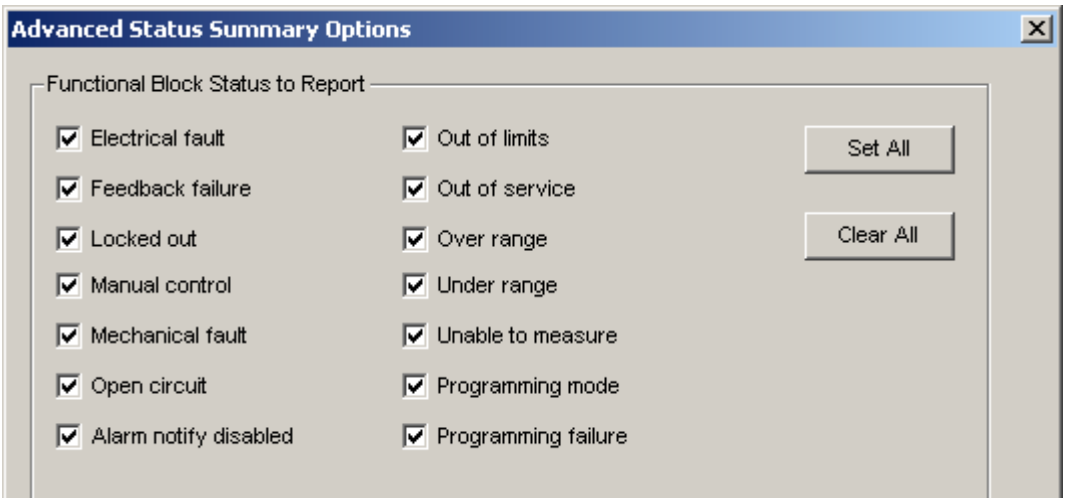
In the **LonMaker - Status Summary** window an overview is displayed, showing the status of the units installed in the network. Among things reported are units without Neuron ID (that is, units that have not yet been commissioned), units off-line etc.

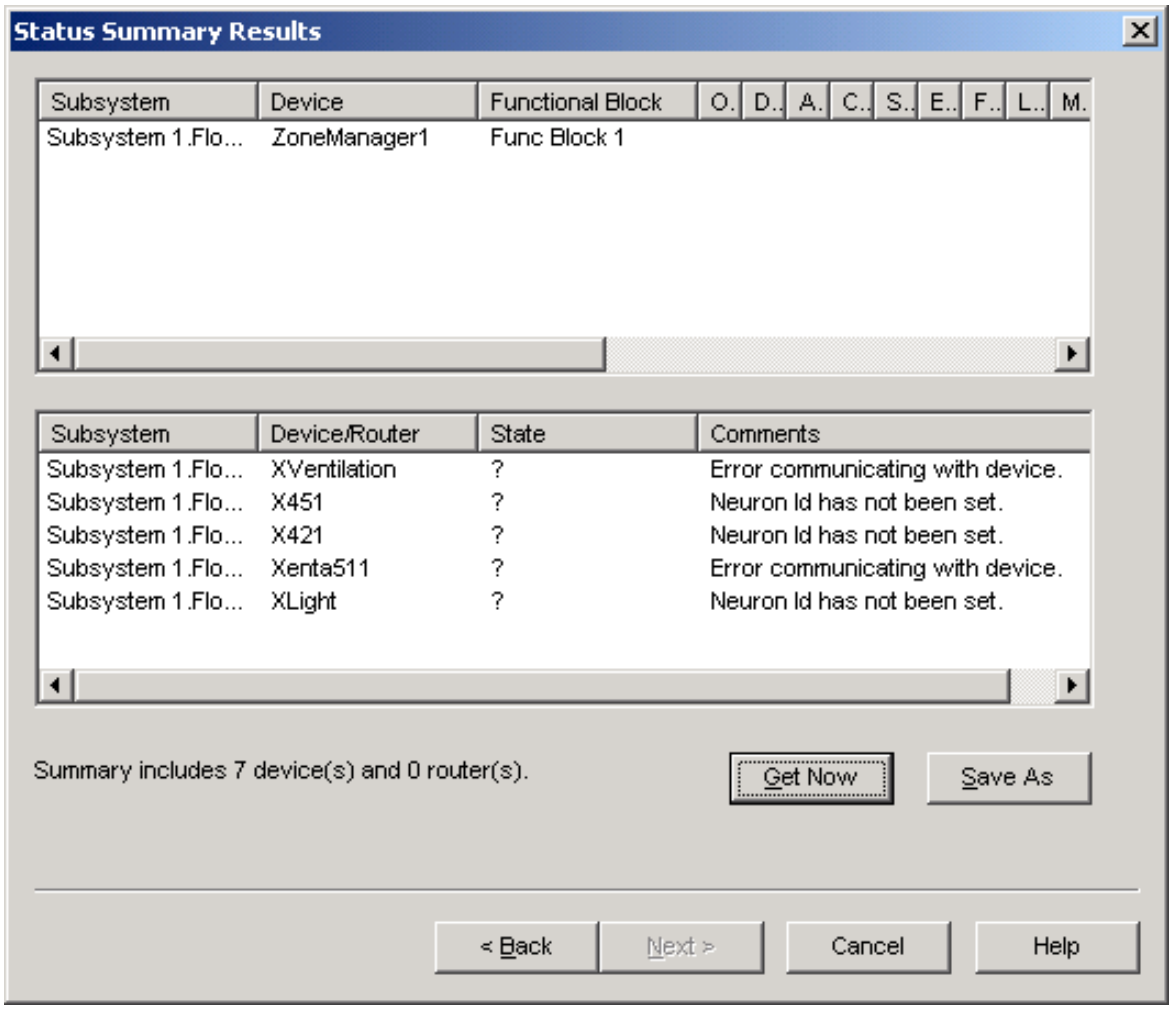


Specify if you want to check the status of the *Entire Network*, of the current *Subsystem Hierarchy* or only of the current *Subsystem Page*.

The *Functional Block Status to Report* is not supported by TAC Xenta. In spite of this, you should *Set All*, as there may be other units in the network that may have things to report.

Checkmarking the *Advanced options* box will give you further options for the presented information.





Click *Get Now* to examine the network. If everything is on-line and working, you will only get a text (*Summary includes ...*) telling you the number of nodes and routers that have been checked.

If there are problems, the corresponding node will be shown in the lower window with a text indicating the type of problem.

In the upper window the status of the Functional Blocks is shown. As this is not supported by TAC Xenta, all TAC Xenta units will show *Error accessing LonMark Object*. For other nodes than TAC Xenta this may indicate a problem, for TAC nodes it can be ignored.

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7 Unit Maintenance

7.1 System Backup and documentation

As was mentioned in section 2.5, we strongly recommend regular backups of all information about the network, connected units and their settings. This is specially true when you are about to modify something in the network, so that it will be easy to restore the earlier, working status.

In LM3 you may specify if the back-up applies to the *database* and/or the *drawing library*. A corresponding choice is made when you want to restore your network with the command *Restore*.

See also *LonMaker For Windows, User's Guide*, chapter 2, the section about *Using LonMaker Backup Files*.

To document all objects, bindings, etc., LM3 has an LNS Report generator.

Please study chapter 7, section *The LNS Report Generator* of the *LonMaker For Windows, User's Guide*.

Unfortunately the collected information is hard to survey and, possibly, too extensive.

7.2 Changing the application in TAC Xenta 300/401

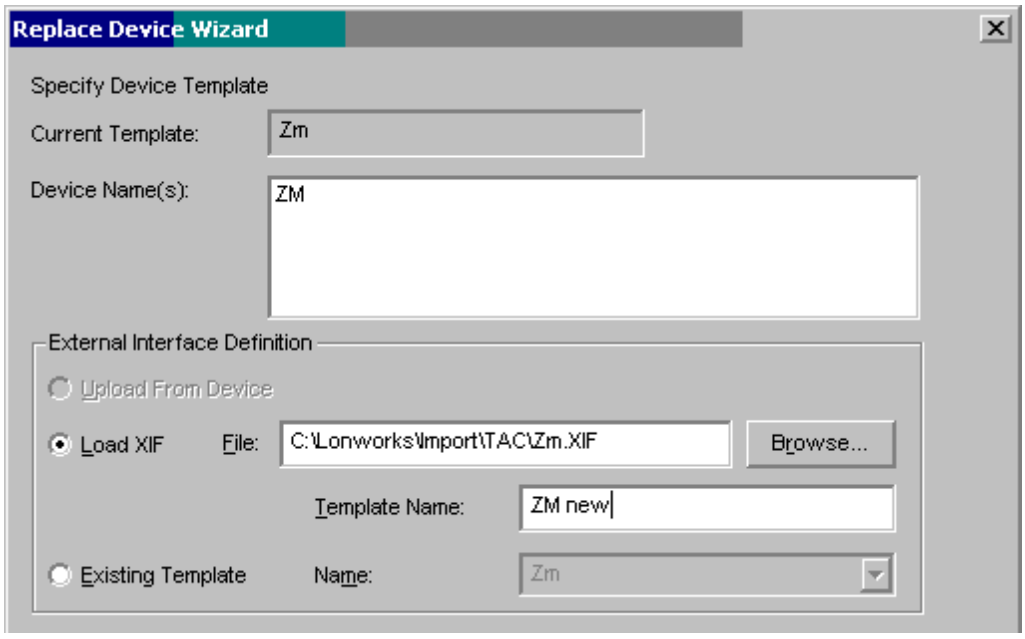
If you change the application program in TAC Xenta 300/401, *without* affecting the SNVTs, it will suffice to download the new program from TAC Menta.

If, on the other hand, the new application *does* affect the SNVT contents, we have another situation. First, when you work with LM version 3, only *add* new SNVTs. Do *not* take away or rename existing SNVTs. Should you still decide to do this, LM might think that this is a brand new application and so erase all associated function blocks, with all their bindings!

We assume that you have followed our piece of advice and only added some SNVTs.

Download the new application to the TAC Xenta via TAC Menta. At this moment the contents of the LNS database will not be up-to-date.

In LM3, click right on the unit, select *Replace…*



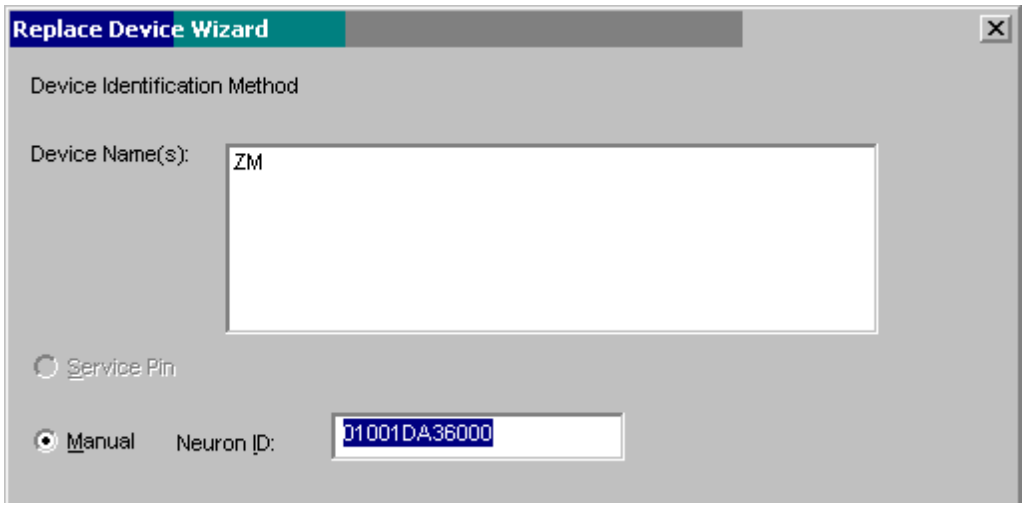
External Interface Definition

Select *Load XIF*, to import the XIF file as a file.

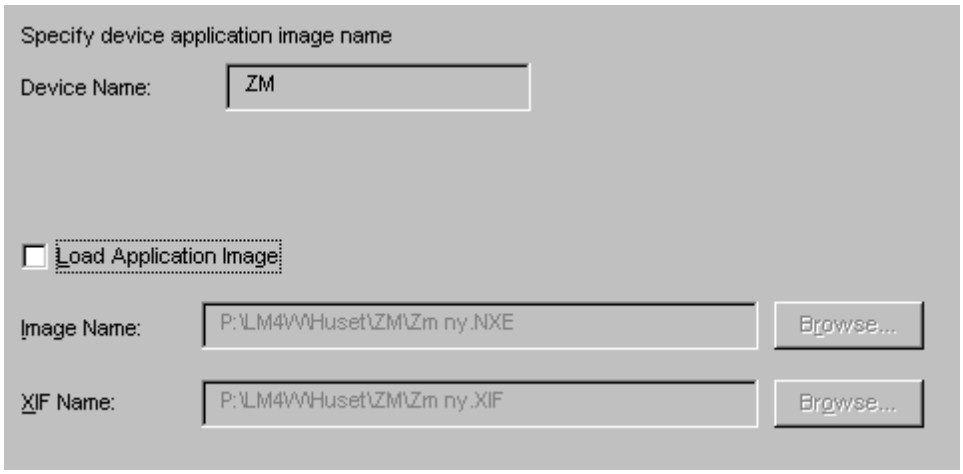
Should you select *Upload From Device* you will have problems with the ‘unit already exists’ etc.

For *Template Name:* enter a new, previously unused name.

Then click **Next >**.

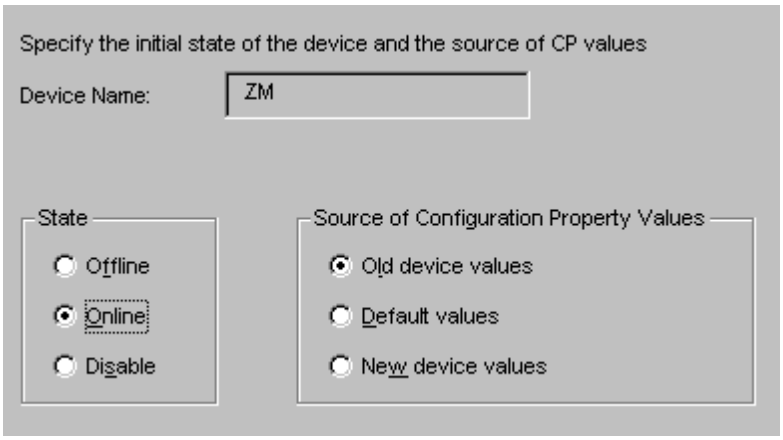


Select *Manual*, that is, manual Neuron ID entry, as the node is already installed and is there.



Make sure you do *not* checkmark the *Load Application Image* box.

As the TAC Xenta controllers are host based, you must not change the Neuron program from the network management tool; this is done from TAC Menta.

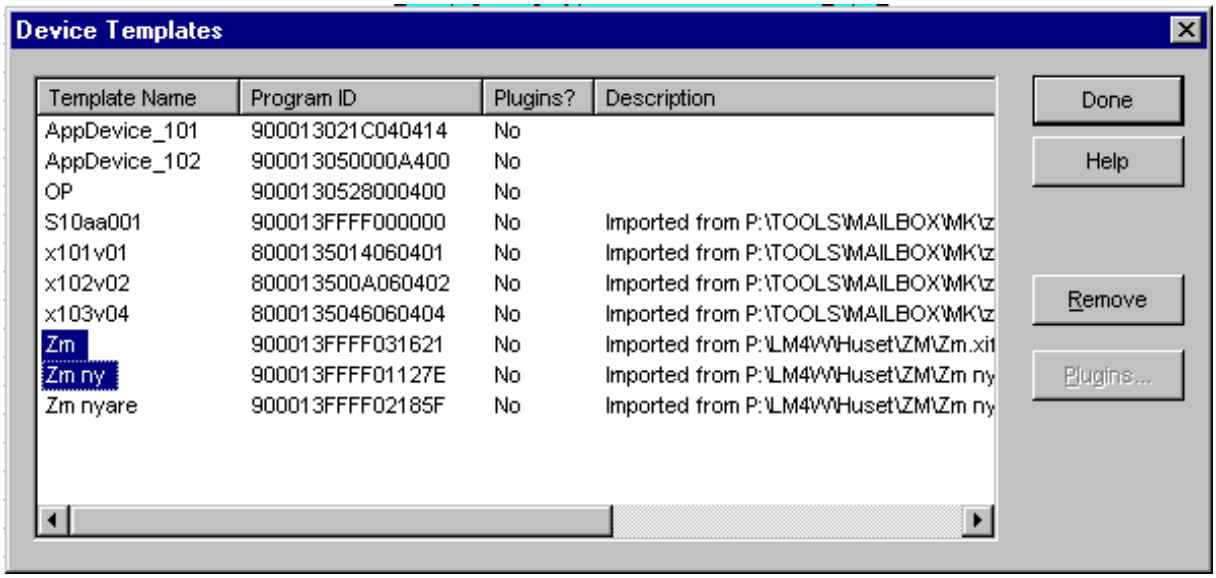


Determine the state of the “new” unit after the installation.

If everything goes according to plan, the SNVTs of the new application are now supposed to be included. Use “drag and drop” to put the new network variables into the function blocks of the unit.

LM3 will also restore all bindings formerly in the unit.

To clean up, it may be convenient to look up which *Device Templates* are no longer in use. Use the tool bar to select *LonMaker - Device Templates…*



Mark *Device Templates* no longer in use and select *Remove*.

Should you mark a *Device Template* still being used, you will get an error message stating that this *Device Template* is in use and cannot be removed.

Action in TAC Xenta 511

If the selected TAC Xenta 300/401 is part of a network under a TAC Xenta 511, also data in this unit must be updated.

Please follow the guidelines presented earlier in this chapter.

After that, start *WebTool* and LNS Explorer (under **Tools** in WebTool) and pull in the TAC Xenta 300/401 anew, from LNS Explorer to its position in WebTool.

Add any NVs in TAC Xenta 511.

Generate and download to TAC Xenta 511.

Start LM3 and replace TAC Xenta 511 in the same way as TAC Xenta 300/401.

Perform any required bindings.

7.3 Replacing a TAC Xenta 400 I/O module

If an I/O module needs to be replaced, the primary objective is to change the Neuron ID in the database of TAC Vista and in the parameter set of the base unit.

Note! The procedure below applies only if the original I/O module was installed using the network management tool.

- Replace the I/O module; it is convenient to note the Neuron ID of the module at this stage.
- In LM3 click right on the current I/O module, select *Replace…* and follow the instructions appearing on the screen (similar to those used at the installation of a new node).
- Should you miss the Neuron ID of the new module:
  click right on the unit, select *Properties* and note the Neuron ID.
- Export the *.ndb-file from the database of TAC Vista.
- Use TAC Menta NCT to enter the new Neuron ID;
  make sure that the *Pre-configured* box is checked.
- Re-insert the updated *.ndb-file in TAC Vista.
- Perform *Download Application and Parameters* to the base unit of the new I/O module.

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Appendix Application Key

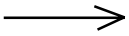
This is an example on the way it may look when you receive an *Application Key*, opening up for the use of new Credits (chapter 2).

TO: Name: * Customer's information
Company: * from the order
Business unit: *
Phone: *
Fax: *
Email: *

FROM: TAC Order Department
Email: order@tac.se
Fax: +46 8 500 101 96 (please use email if available)

SUBJECT: Application Key Generation Report

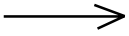
DATE: 2000-04-11 15:26:21



Thank you for your order. It has been successfully processed.
Your Application Key is: E1FB 86D7 6F84 CC88 79A0 5EBB 92
Please use your License Wizard to enter the Application Key and view a report on the upgraded license.

Order Summary:

PC Key: DFBB E4DC 7646 3D7B E8 - ADFA 79A9 4363 354F 18AD FD16 A943 60EA 4F18 2DF9 91AA 3050
Product License: LonMaker
Serial Number: 9947B73-04673



Credits Added:
Item Number: 9-008-0003-0
Number of credits ordered: Add 50
Number of credits charged: 50
Price Each:
Subtotal:

Resulting Features: ID 4
(Standard Features)

Subtotal:

Total Price (Credits + Features):

This order was processed by Administrator ID: N.N.

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Special characters

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www.tac.se

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