MICRO THERMO TECHNOLOGIES

MT Alliance Installation Manual

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MICRO THERMO
TECHNOLOGIES

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Table of Contents

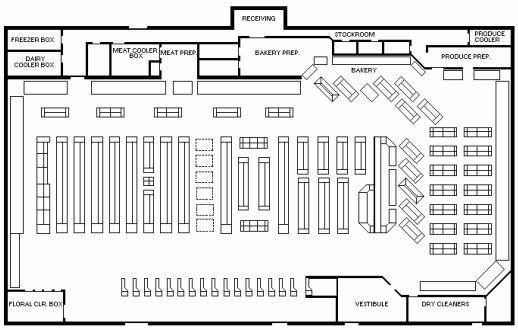
1 - Overview

Think of the MT Alliance as your assistant. It provides you with up-to-date, complete and relevant information. It notifies you whenever a problem arises.

The MT Alliance Information and Control System is a software platform that interacts with distributed intelligent electronic modules (called nodes). The nodes provide full monitoring and control of your refrigeration, HVAC, lighting and energy subsystems. They control your refrigeration racks and continuously monitor the food cases to prevent product loss 24 hours a day. You will be warned when perishable food products are in danger and that action must be taken before loss occurs. They also control all HVAC equipment such as rooftop units, air handler units, zone controllers, etc. You can adjust room temperature and humidity setpoints. You can adjust lighting schedules or manually set lights on or off. You can get a detailed profile of electrical power consumption.

MT Alliance is the state-of-the-art in monitoring technology for refrigerated cases. Each case can be installed with one or more temperature sensors. Sensors measure the discharge air temperature, the actual product temperature, or a simulated product temperature. Each monitored point is assigned a low limit a high limit an alarm delay, etc. MT Alliance is a tireless assistant with a phenomenal memory: years worth of logged data, up to one-minute intervals, may be retrieved instantly for each point. It also supports dual temperature cases. Toggling the switch on your dual temperature case does not create false alarms**.** MT Alliance can also send complete alarm information to your alphanumerical pager.

MT Alliance is user-friendly because it displays your site graphically. Red buttons located directly on the floor plan indicate the location of active alarms. By simply pointing and clicking, you get detailed information about each sensed point. It is easy to review alarm limits, to browse the graphical log of measured values, to determine when alarms occurred and who acknowledged them. A new employee can be trained to use the MT Alliance in less than one hour.



MT Alliance is safe because each user has his own specific access permissions. It is possible to give your personnel access to only that portion of the system appropriate to them. Each user must log in with his account. The MT Alliance keeps a complete record of who did what and when.

MT Alliance is open because it supports electronic modules from other manufacturers (LonWorks® and MT Alliance Compatible). It is open because it is possible to export monitored points to Microsoft Excel®. It is open because a wide variety of sensors from many manufacturers is supported.

MT Alliance is forgiving because it automatically turns monitoring back on if the user forgets to. It also automatically logs the user out if he or she fails to do so.

MT Alliance is flexible because it is possible to communicate with the system from a remote location. With a modem and a phone line, everything a user can see and do at the MT Alliance workstation can be done remotely.

MT Alliance is a time saving tool for experienced refrigeration technicians. They can diagnose problems and fine-tune the refrigeration system simply by looking at the graphical temperature log of a given refrigerated case. This means better adjustments of the refrigeration process, greater energy savings and lower maintenance costs for you.

MT Alliance is robust because the intelligence is built into distributed electronic modules. Alarms are received even if the personal computer is turned off. Furthermore, the built-in watchdog restarts the system if, for some reason, the PC becomes inoperable.

MT Alliance grows with your needs. Whenever additional equipment needs to be monitored and controlled, simply add sensors, sensor nodes, alarm relays and alarm relay node: MT Alliance can handle it.

The MT Alliance Information and Control System consists of several components. The MT Alliance software runs on a Windows-based PC usually located in an office environment.

The network components, on the other hand, have been spread out across your site. They can be above or below refrigerated cases, in the mechanical room, in the electrical room, on the refrigeration racks, inside controlled equipment, on the roof, etc. They are all linked together with a data cable (a twisted pair wire). Some may share a low voltage power cable or be powered independently. Nodes can measure things via sensors connected to them. Nodes can control things via controllers connected to them. Nodes can also measure or control things by talking or listening to other nodes via the data cable.

For example, you can have nodes to do the following tasks:

- 8 inputs alarm sensor node
- 4 outputs Alarm controller
- Real-time clock node
- HVAC scheduler node
- Lighting scheduler node
- Suction pressure controller Node
- Compressor controller Node
- 5 Circuits controller Node
- Condenser controller Node
- HVAC controller Nodes (RTU, AHU, etc.)
- Light controller Node
- Case temperature display node
- Rack pressure display node
- Others

2 – Getting Started

This section will show you how to configure the site from A to Z.

2.1 Log In 

From the main menu, select **Access – Log in…** or click on the "Key" on the toolbar. Enter your account and your password. You can optionally specify how long before the Alliance logs you out. By default, Alliance will log you out after 15 minutes.

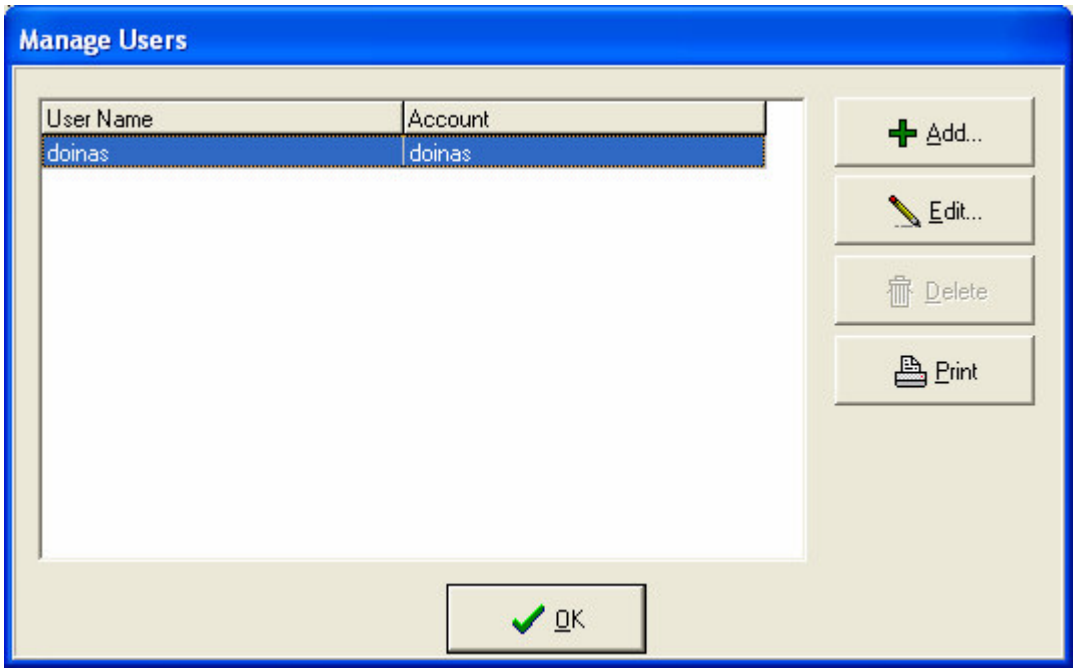
Your password may consist of any characters except $. The password is not case sensitive (a = A). If you have forgotten your account or password, contact your immediate superior. If you are a supervisor, manager or owner and have forgotten your account or password, contact technical support as described in the About Window (**Help – About**).

2.2 Log

Click on the "**Key**" on the toolbar. Don't do anything more, just leave the "**Log In** window there

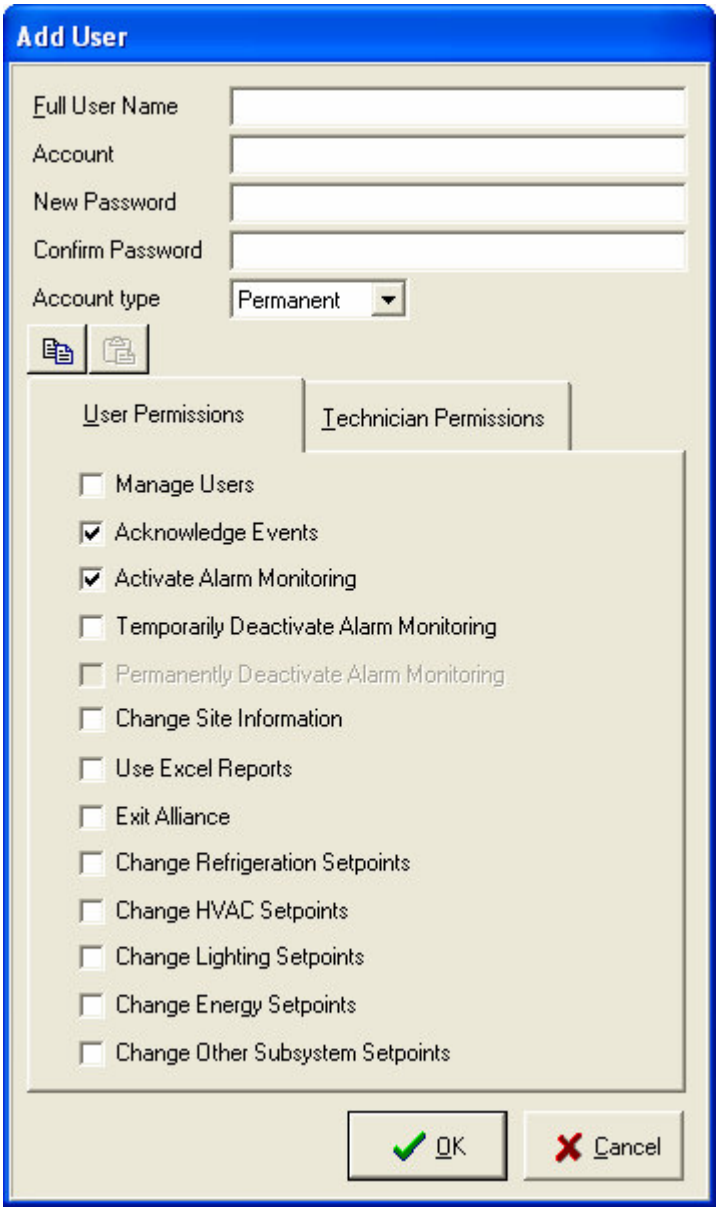
2.3 Manage Users

From the main menu, select **Access – Manage Users…**. You will see a list of the currently defined users, showing their user name and account information. There is no limit to the number of users you can define. Each user must have a unique User Name and Account. When you log in with your account and password, your user name appears on the status bar at the bottom of the main window. Every action or change you make is logged with your user name on it.



2.4 Add a User

To add a user, click on the "Add" button. The "Add User" window will appear:



If you do not have the permission to manage technicians, you will not see the "Technician Permissions" tab. Give to your new user a full name (e.g.: James Woodbridge). If you have two employees with the same name, add something to the full user name to distinguish between the two. Give your new user an account that nobody else has used (if you do, the MT Alliance will tell you). The account may consist of any characters except $. The account is not case sensitive (a = A). Then give your new user a new password. You need to re-enter the password a second time to confirm it.

By default, the account is permanent. If you select a temporary account, you will be able to specify and exact date at the end of which the account will be automatically deleted.

The "User Permissions" tab let you specify permissions the new user will have in the MT Alliance. Most permission are self-explanatory. "Change Site Information" gives a user the power to edit begin site information. Avoid giving your users the permission to "Exit Alliance", because when they exit the MT Alliance, all historical data gathering is stopped.

You may optionally copy the permissions from one existing user to other users you create. Once you have copied the user permissions, you only have to click on the "Paste" button to apply permissions to a new user.

If you want a user to adjust HVAC temperature or humidity Setpoints, select the "Change HVAC Setpoints" permission. If you want a user to override or modify lighting schedules, select the "Change Lighting Setpoints" permission.

The "Change Refrigeration Setpoints" permission allows the user to fine tune things like rack suction pressure Setpoint. Needless to say, give that permission only to qualified refrigeration technician.

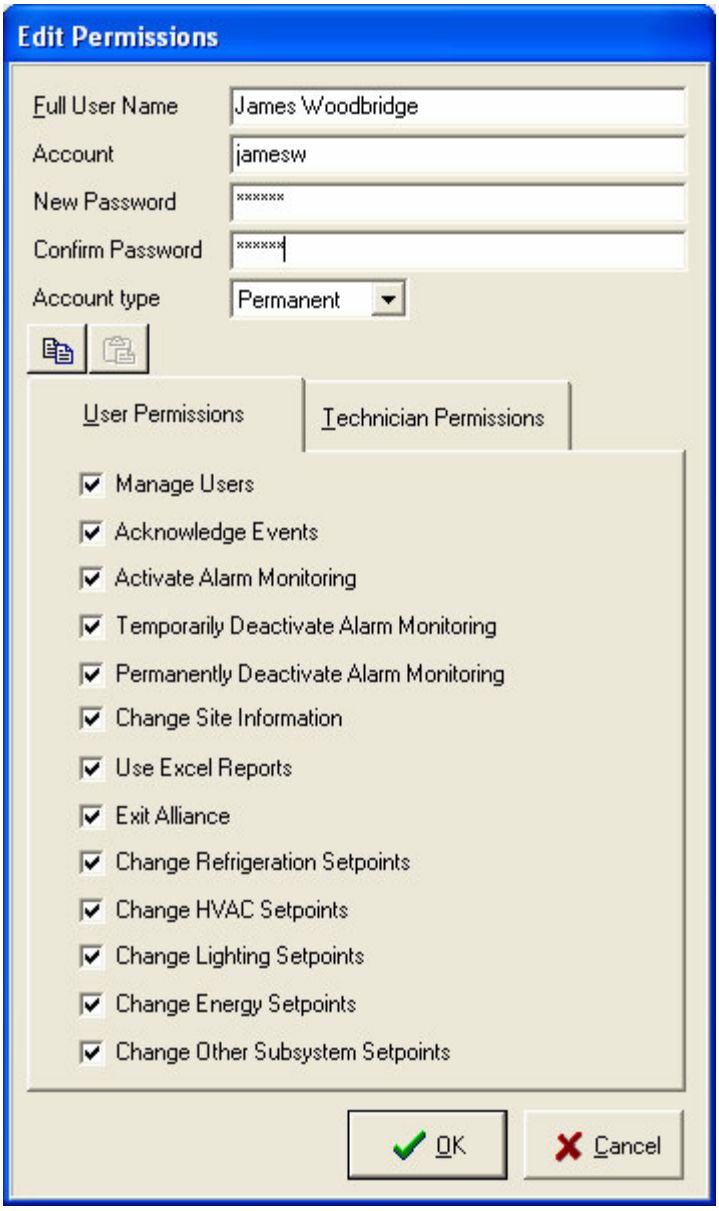
In the "Technician Permissions" tab, you can grant a user the permission to perform configuration tasks in a particular subsystem. Maintenance permissions should only be given to experienced technicians. Entering maintenance mode allows a technician to fine-tune the control system.

In the same tab (not shown here), you can also grant a user the permission to perform configuration tasks in a particular subsystem. Configuration permissions should only be given to experienced installers of the system. Entering Configuration mode allows the installer to add or remove electronic control modules.

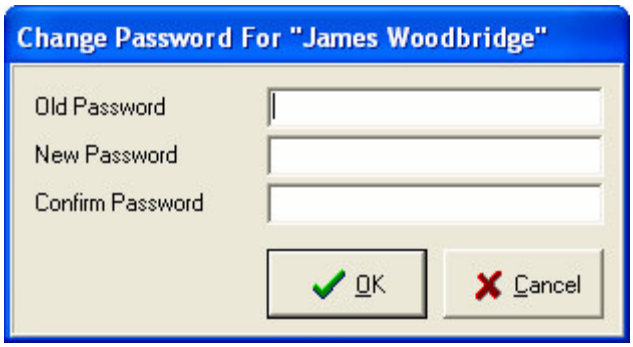
The "Configure Alliance" and "Connect Subsystems" permissions should be given to experienced installers.

2.5 Edit a user

In the "Manage Users" window, select the User Name / Account you want to modify and click on the "Edit" button. In this mode you can either change the user name, the account information, the password, the account type and the user/technician permissions. Once completed, click the "OK" button to proceed.



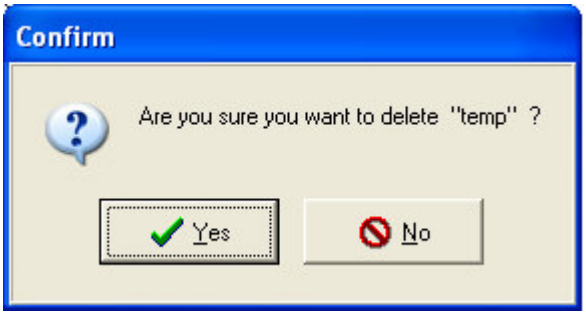
You can also modify the password information by selecting from the main menu **Access – Change Password**.



Provide the old password and enter the new password twice in order to confirm the modification of your Password. Then click the "OK" button to save your modification.

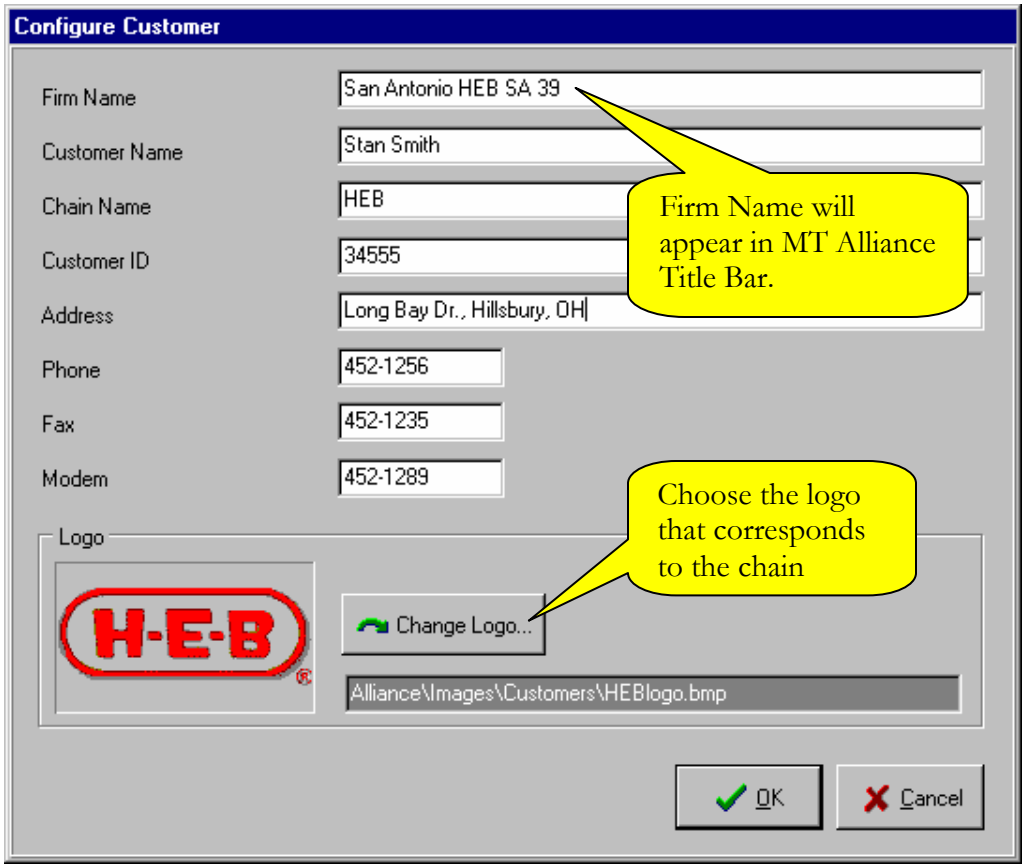
2.6 Delete a User

In the "Manage Users window, select the user you want to delete and click on the "Delete" button. You will be able to confirm or cancel the deletion.



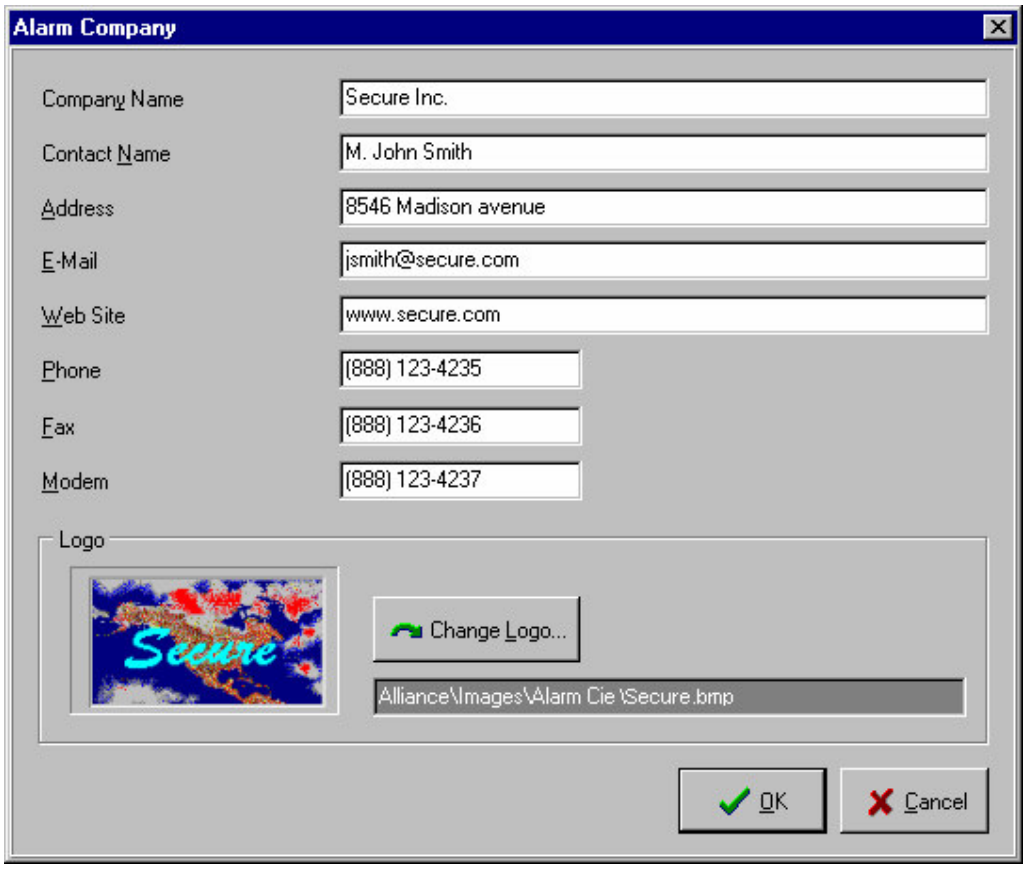
2.7 Configure Customer Information

You should now enter customer related information. On the Main menu, select **Configure – Customer**. The "Firm Name" is the official store name. It is displayed on the MT Alliance title bar once you have entered it. The "Customer ID" is a reference number provided by the technical support company. That may be you or Micro Thermo Technologies. If you cannot find the logo of this chain, ask Micro Thermo Technologies to make one for you. You can now edit phone numbers, your address, etc.



2.8 Change Alarm Company Info

You can change the Alarm Company Information by selecting **Support – Alarm Company** from the Main menu. The "Configure Alarm Company" window looks like this:

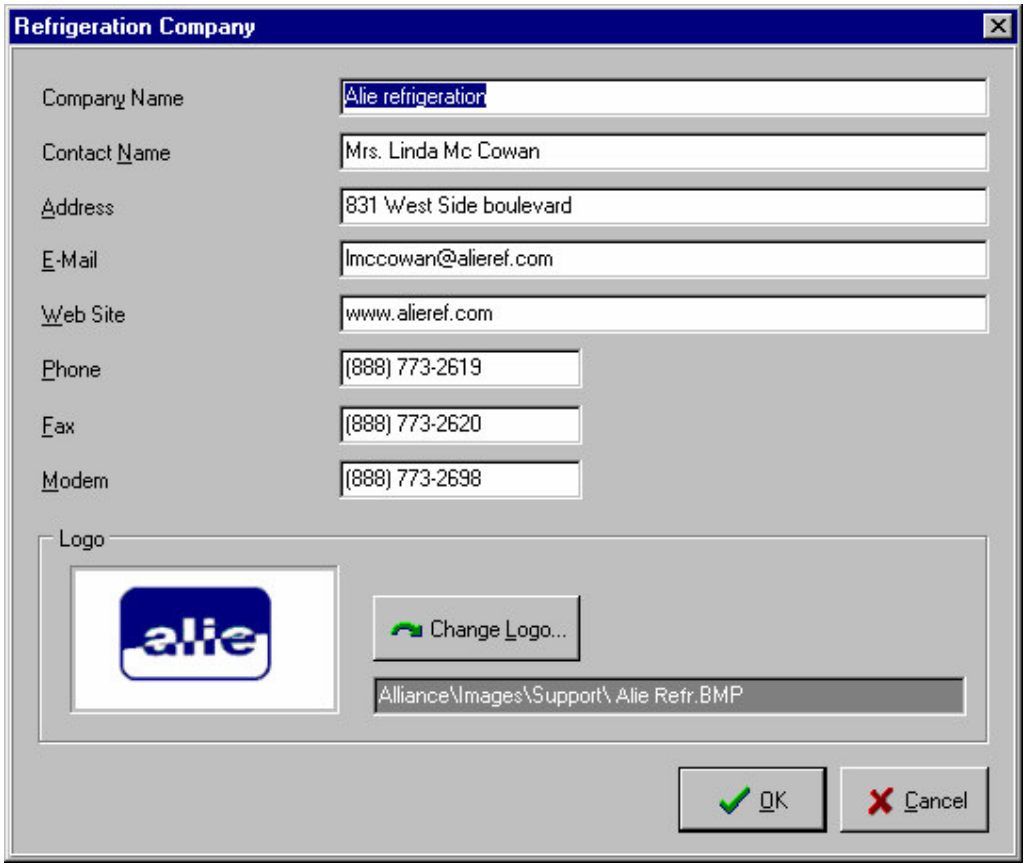


Correct the information related to the Alarm Company. Note that the e-mail and web site information will work only if the PC has access to the Internet.

2.9 Change Refrigeration Company Info

You can change the Refrigeration Company Information by selecting **Support-Refrigeration Company** from the Main menu. You can proceed the same way with the other support companies: HVAC, Lighting, Energy, etc.

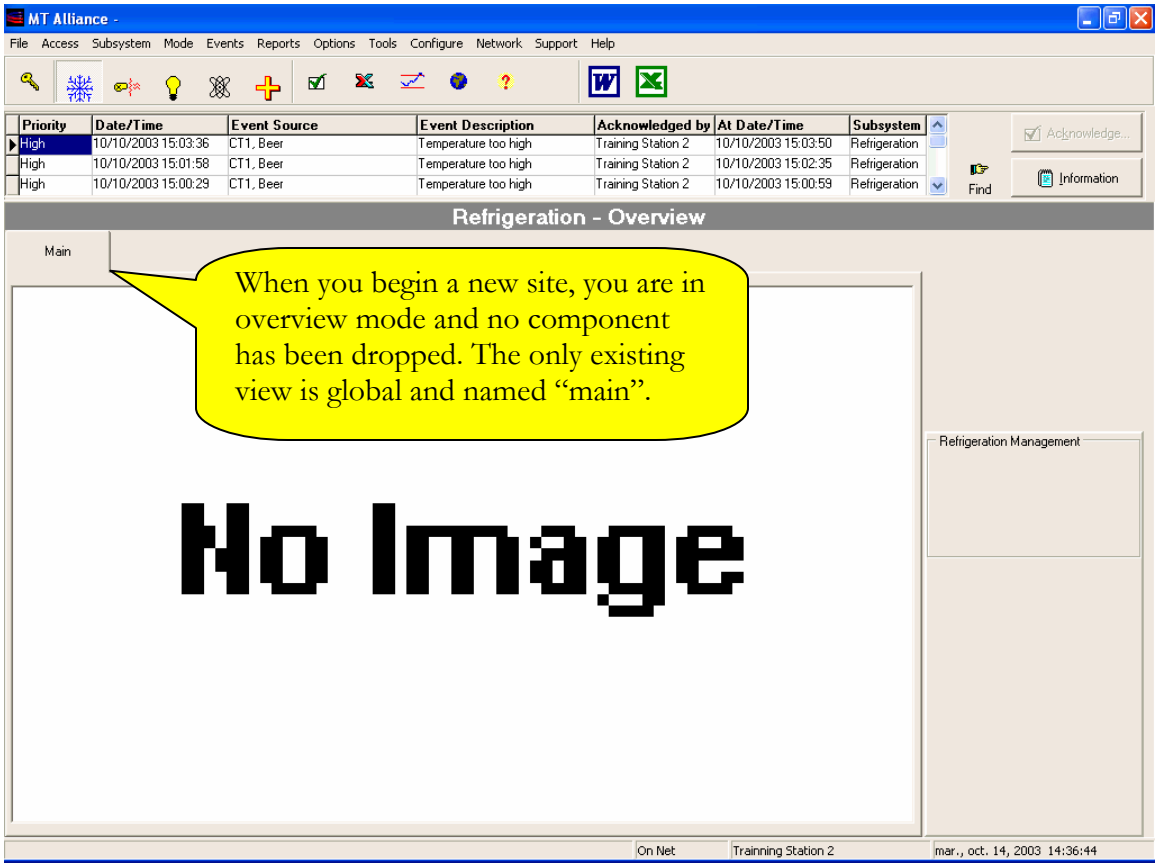
The "Configure Refrigeration Company" window looks like this:



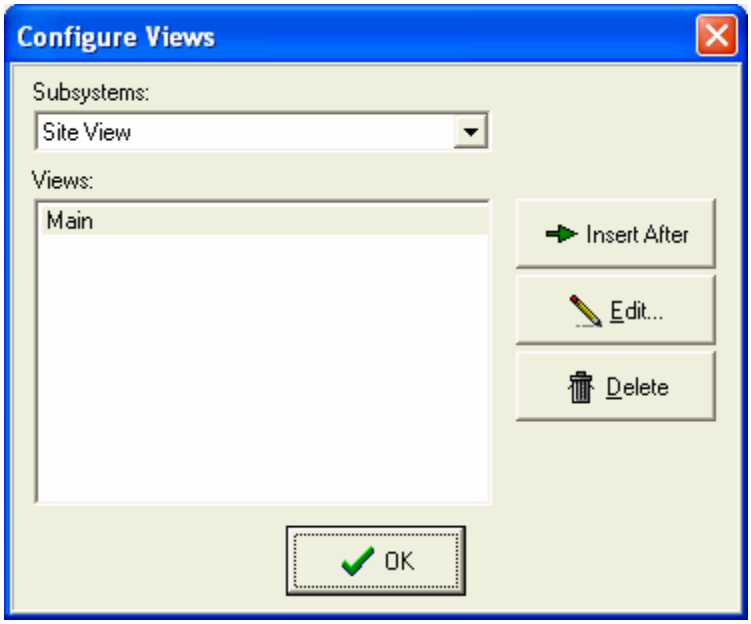
2.10 Configure Views

A view is usually a floor plan but it can also be a rooftop unit or a refrigeration rack. There are two types of views: global and local. Global views are always visible. An HVAC local view will be shown only when the HVAC subsystem is activated. An HVAC local view can only contain HVAC components. In contrast a global view can contain components from any subsystem.

There must be at least one global view. Only 8 views can be visible at any given time. If you only have one global view, you can have 7 local refrigeration views, 7 local HVAC views, 7 local lighting views, 7 local energy views, and 7 views for up to 3 subsystems that you can define. The minimum number of views is 1 and the maximum is therefore 50.



From the Main Menu, select "**Configure Views**". The "**Configure Views**" window comes up. First (and mandatory) select the subsystems "Site View" and select the "Main" view. Then select the option "Edit" to configure that view.

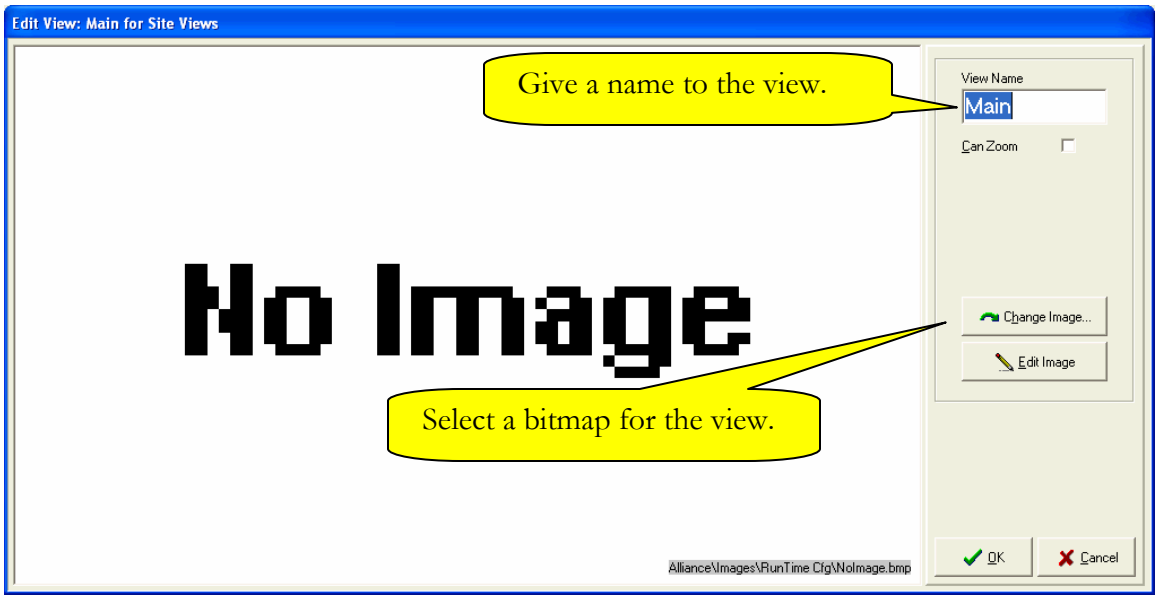


First give a name to the view. Then select if that view will be zoomable. To have a zoomable view, check the "Can Zoom" checkbox.

If you want to be able to zoom on a view, you must then select the zoom factor (from 2 to 6). A zoom factor of 2 means that you will be able to zoom on a portion of the view that is half as wide and half as tall as the full view. That corresponds to one quarter of the original picture. Similarly a zoom factor of 3 means that you will be able to zoom on a portion which is a third as wide and a third as tall as the full view. It is like cutting the full view into 9 equal pieces.

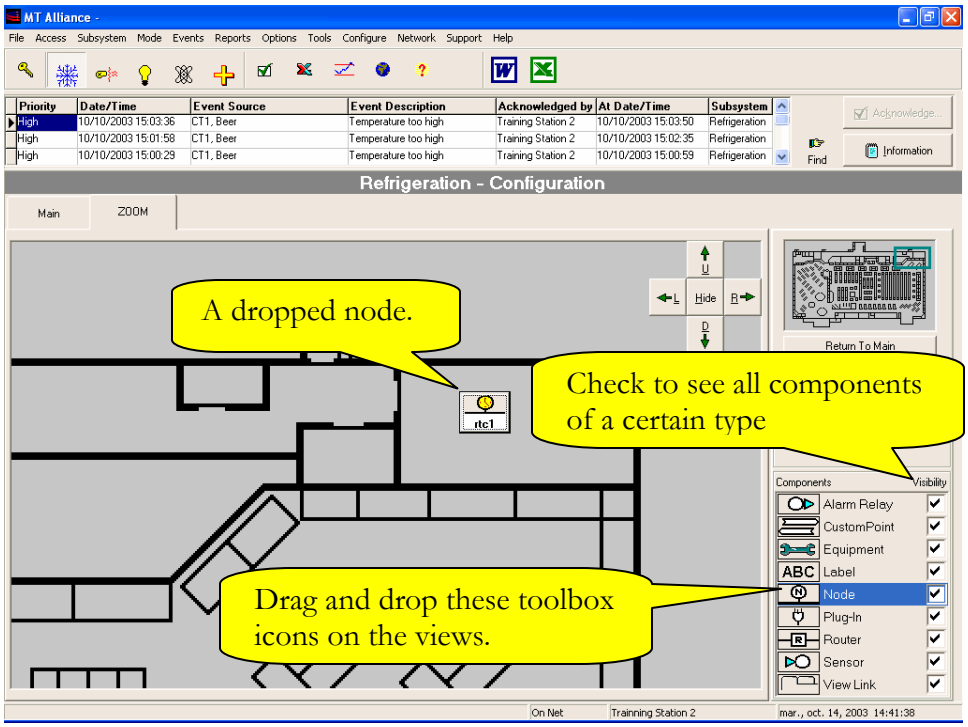
You can change the zoom factor at any time if you are not satisfied with the results. Be careful however when decreasing the zoom factor (e.g.: from 6 to 2) after components have been dropped on the view. Even if the Alliance attempts to keep components at the same place, some will move slightly and that is not reversible (e.g.: changing from 2 to 6 will not bring the components exactly at their original location).

The next step is to specify a bitmap for this view. If you did not obtain a system that is already configured with views, then you must add you own views. If you have specified that the view is zoomable, you will have to provide a bitmap for the normal view, the zoomed view and the mini view. The same bitmap can be used for the normal, zoomed and mini view. But the result will be better if you specify three different bitmaps for the view. With a single bitmap, the mini view will look like its missing lines. And when you zoom, the diagonal lines are going to be coarse. If you provide 3 different bitmaps for the same view then they have to be exactly of the following size (width in pixels and height in pixels): 160x95 for the mini view, 800x475 for the normal view and 1600x950 for the zoomed view.

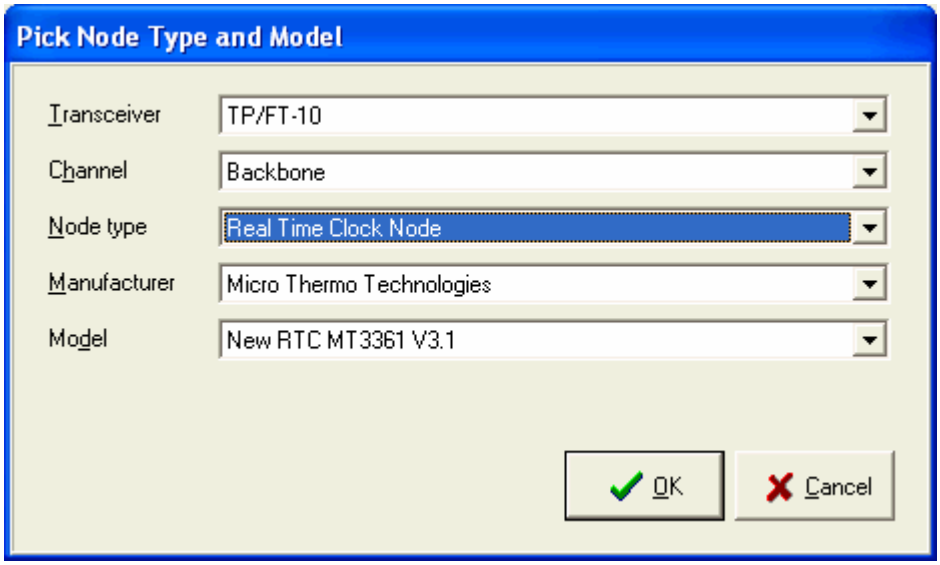


2.11 Dropping Components on a view

The following paragraphs will explain how to drop each type of component on views. Before dropping any components, select the subsystem were you want to drop this component (e.g.: refrigeration, HVAC, lighting, etc). Then select the view on which you want to drop this component. For better visibility, you can possibly zoom on the view. Then go in "**configuration mode**". A components toolbox will appear on the right-hand side of the screen.



Drag an icon from the toolbox to the desired location on the view. When dropping the component a window to pick the type and model of the component drop comes up and ask you for these information's.

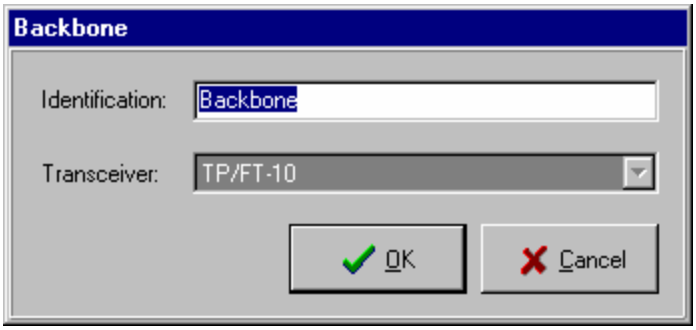


Finally, a button will appear on the screen to represent the component. The visibility checkbox to the right of each component icon is used to filter out components when there are too many on the views. The filtering only applies when you are in **configuration mode**.

Once a component has been dropped, you can move it by pressing and holding the "CTRL" key on the keyboard and by moving the mouse.

2.12 Configuring the backbone

From the menu, select 'Network' and the 'Backbone...'. The following window will come up:



You can change the backbone identification if you want. If you have not dropped a single node or a single router, you will be able to select the backbone transceiver type. From most supermarkets, TP/FT-10 is sufficient. For small buildings, TP/XF-1250 is more appropriate.

You must select the transceiver according to the network interface card transceiver that has been installed on the PC. To find out which type it is, go to the Windows control panel, click on the LonWorks Plug and Play icon. The transceiver type will be displayed.

If the transceiver type of the LonWorks Interface Card is not what you wanted, you have to order a new card immediately. Do not start dropping routers and nodes if the backbone transceiver type is not what you wanted. Once you start dropping components, you will no longer be able to change the transceiver type.

2.13 Dropping Routers

The MT Alliance system architecture is very simple. The PC is always connected to the backbone. The backbone can be TP/FT-10 (free topology) or TP/XF-1250 (bus topology). Free topology allows for 500 meters of wiring and 62 nodes (also called a segment). If a physical layer repeater is used, you can increase wiring by an additional 500 meters and another 62 nodes (another segment). Using physical layer repeaters in series (500 meters - repeater - 500 meters - repeater - 500 meters) is not allowed. If you do that, network communication will be intermittent at best and most likely unreliable most of the time. However you are allowed to use physical layer repeaters in parallel. The PC is always on the same side and the repeaters are all at the same location. Even if you add 3 repeaters and create 3 segments, you are still limited to 124 nodes. Free topology provides a bandwidth of 78 kbps. One channel terminator is required for each segment and can be located anywhere on the segment.

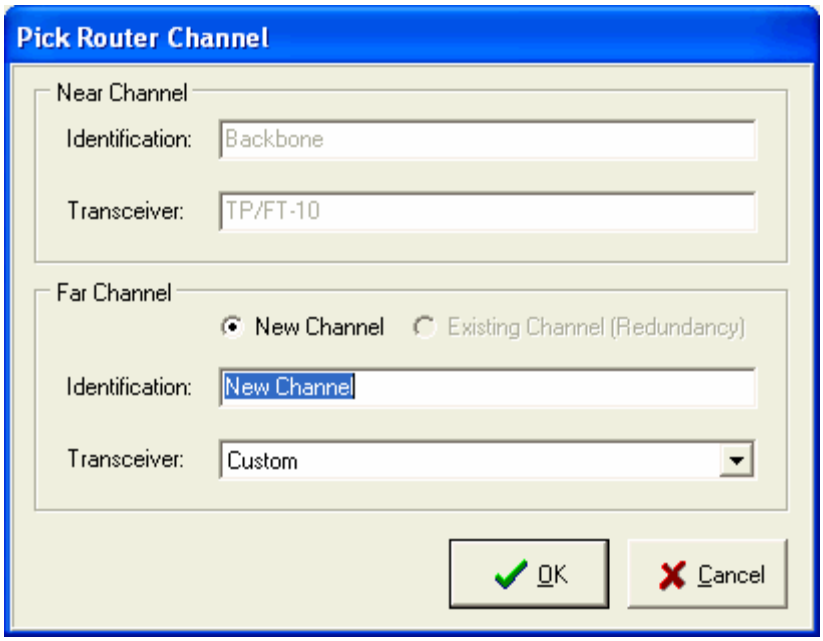
The bus topology requires a special cable. You are not allowed to install more than 8 nodes per 16 meters of wiring. Bus topology requires two special resistors which must be located at each end of the bus. If you want to splice the bus to go to a node, you cannot exceed 30 cm (1 foot). Bus topology provides a bandwidth of 1.25 Mbps (about 16 times more than free topology). Bus topology requires a special PCLTA-20 card. You cannot install free-topology nodes on a TP/XF-1250 backbone. You can only install nodes which have the TP/XF-1250 transceivers.

Now let's talk about routers. Routers are always installed on the backbone. Routers have two sides. The near side is always on the backbone. The far side creates a new channel. Using routers allows you to break the 124 nodes barrier. For example, installing a router with a free-topology far side allows you to install another 62 to 124 nodes on an additional 500 to 1km wire depending if you add a repeater or not on the far side. Routers provide another extremely useful function: they filter network communication. Network messages (SNVTs) on the far side whose destination is on the far side will not go through the router and on to the backbone. Unlike physical layer repeater, routers do not amplify network noise. Only valid messages whose destination is on the other side of the router will be forwarded. It is highly recommended to use a router to isolate the rack control nodes from the rest of the network.

The first thing to do is to plan ahead depending on the size of the site and the amount of nodes that will be installed. First you must decide whether the backbone will be free-topology or bus topology. That decides which PCLTA-20 card must be installed in the PC. Then you have to plan how many routers you will use, where they will be located and what nodes are going to be on the far side.

To select the type of backbone transceiver used, go to 'Network-Backbone' and specify the transceiver type.

To drop a router, you must first enter in Configuration mode. Routers can only be dropped on global views. Routers are visible across all subsystems. If you cannot drop a router, you have not been given the 'connect subsystems' permission.



As you drop a router, you are asked if this will create a new channel or if this will reuse an existing channel thereby creating a redundant router. If you create a new channel, you have to give it a name (e.g.: Racks, HVAC/Lighting). Then you have to specify the transceiver type of the far side.

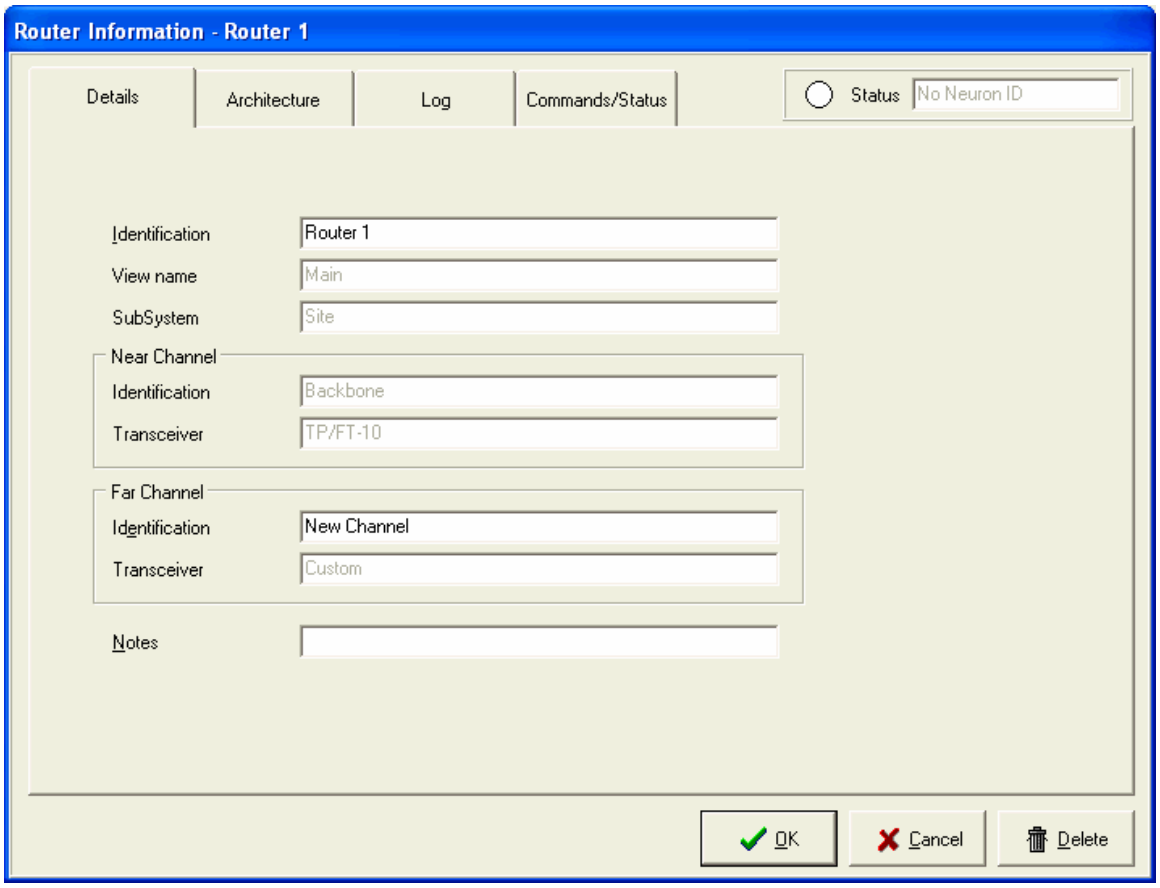
Redundant routers are mostly used if the far side is an RF transceiver. Using redundant routers allows you to increase the coverage area inside the store. Redundant routers are usually only useful on 'open media' like RF to cope with an 'ear-shot' problem. Using cooperating RF nodes to perform complex control functions is not recommended as RF is inherently less reliable than a cable. Alarms sensor nodes that are not involved in temperature terminated defrosts are good RF node candidates.

You can get more information about recommended network topologies in the 'Volume 5: System Architecture Guidelines' document.

In configuration mode, with a right-mouse click on the router button, you can highlight the near channel or the far channel. Highlighting the far channel highlights all far channel nodes and redundant routers. Highlighting the near channel highlights all near channel nodes and all routers.

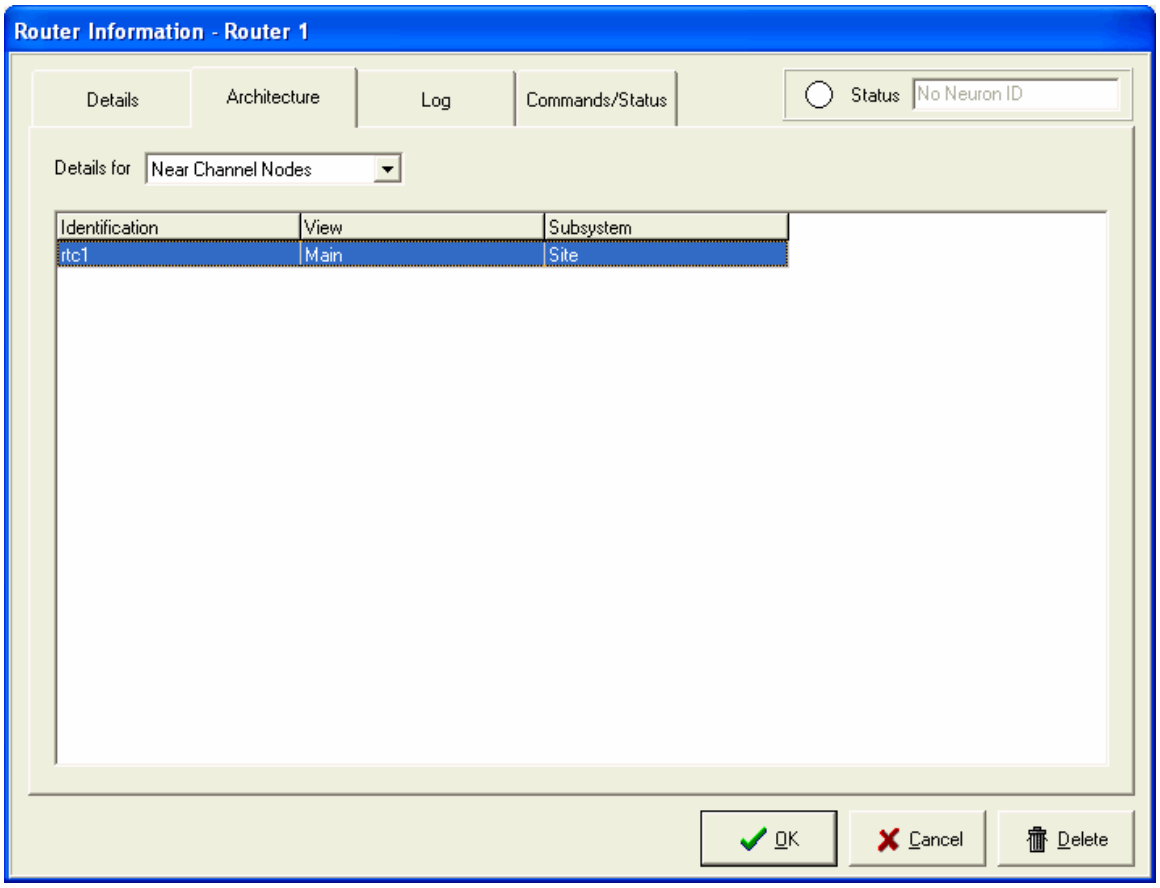
2.14 Configuring a Router

Now click on the button that represents the router. The following window will come up:

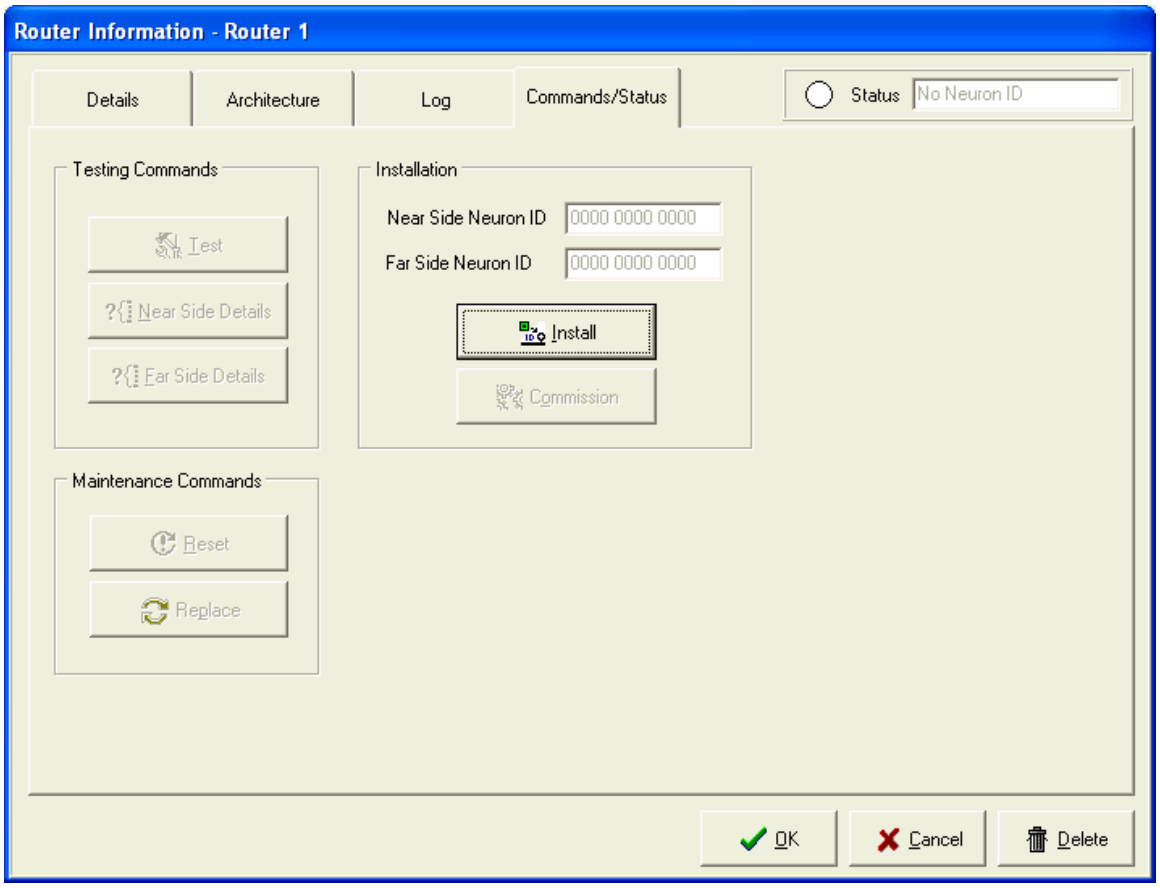


Give the router a unique identification. You can also change the far channel identification too. You cannot change the far channel transceiver type once a router has been dropped. You must delete the router and drop it again if you selected the wrong type.

Note that you cannot delete a router once you have dropped nodes on the far channel. You first have to move or delete all nodes on the far channel before deleting the router. Deleting a router also automatically deletes the far channel (except for redundant routers).



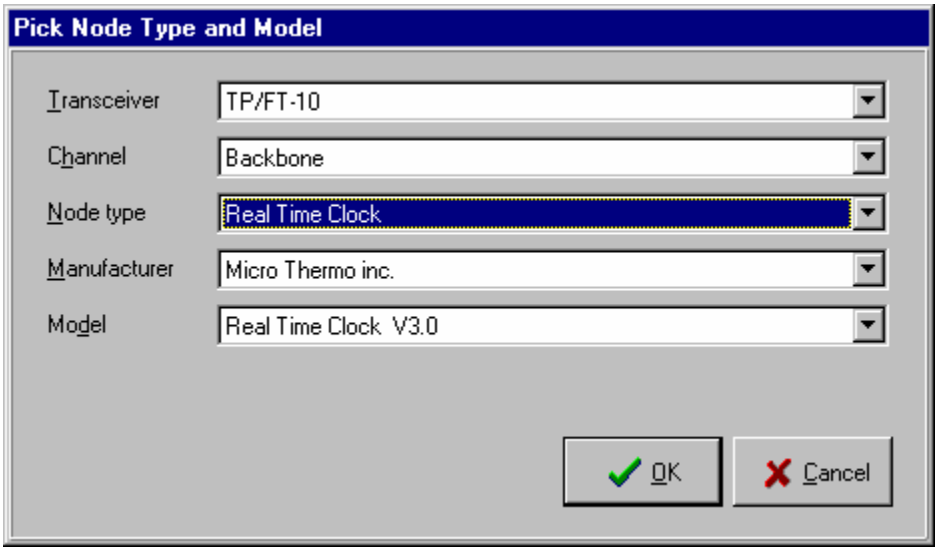
The **Architecture** tab allows you to see all near channel nodes, all far channel nodes and any redundant routers.



The **Command/Status** tab for routers is simpler than for nodes. A router has two Neuron Ids and you can get the details of both sides. Furthermore routers do not wink.

2.15 Dropping a Real Time Clock

You can drop a real-time clock just like you drop a router. Just go into configuration mode first, select and possibly zoom on a global view and then drag and drop a node. The following window will appear:



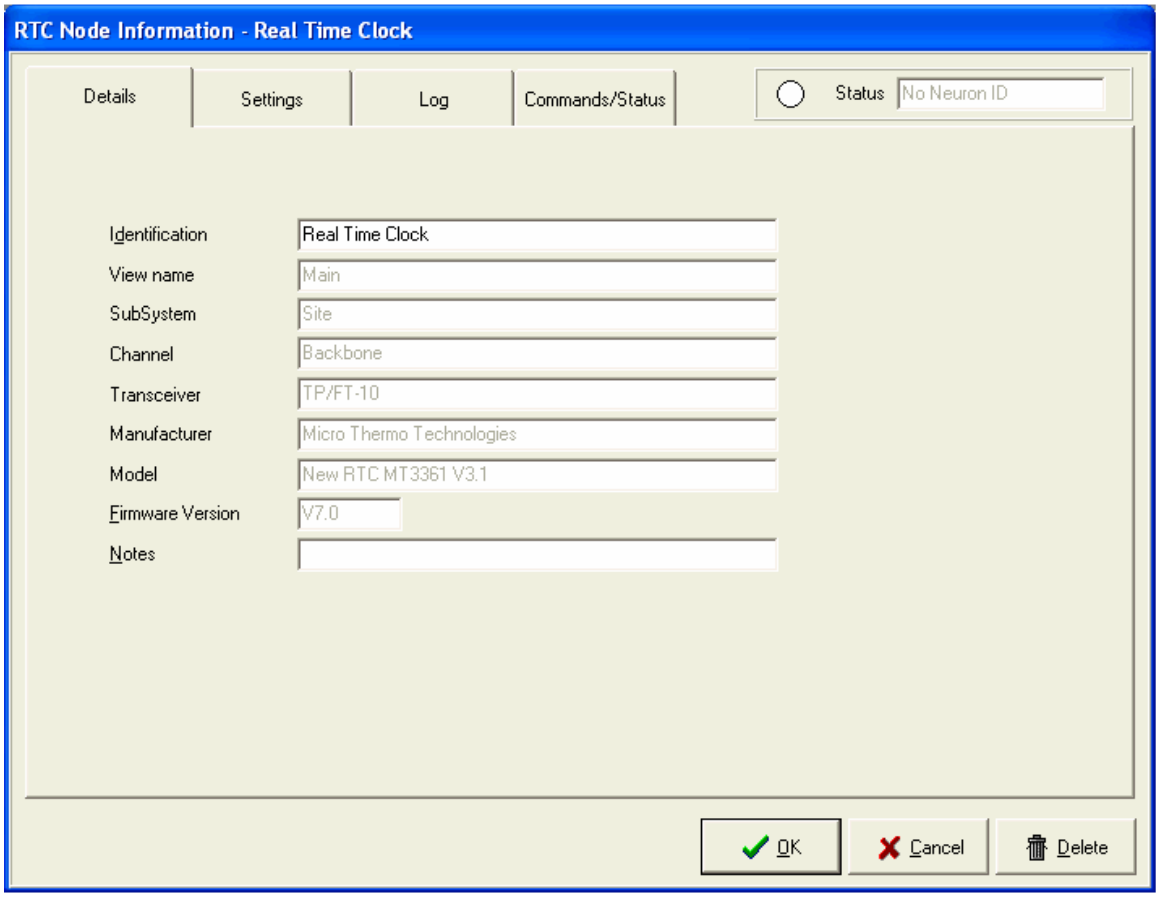
First specify the transceiver type of the Real-Time Clock you have in hand. Then select the channel on which it will be installed. If routers are used, it is highly recommended that the Real-Time Clock be installed on the backbone. This way, if a router fails, all nodes on the backbone or on the far side of all other routers will still get the system time. If you have a TP/XF-1250 backbone, be sure to order a Real-Time Clock with a TP/XF-1250 transceiver.

The next step is to select 'Real Time Clock'. If you do not see it in the list of possible node types then either someone else has already dropped it or you did not select a global view before attempting to drop.

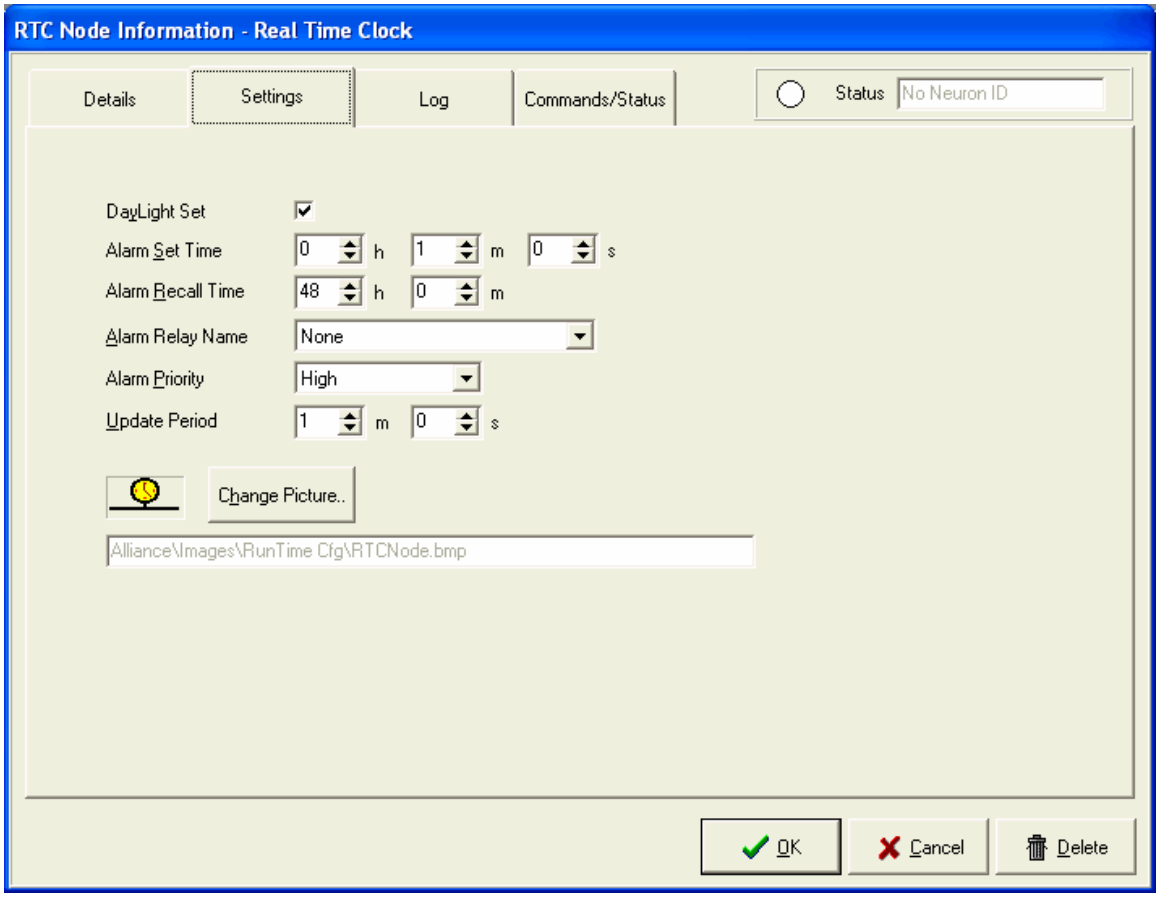
The Real-Time Clock should be dropped before other nodes. That is because the MT Alliance automatically connects the real-time clock to all other nodes. If you drop the Real-Time Clock after all the other nodes, it will work but it may take several minutes before all the connections between all the nodes are made. The MT Alliance will look like it is frozen but it will in fact be working.

2.16 Configuring a Real Time Clock

Click on the icon that represents the real time clock to open it. The following window will appear.



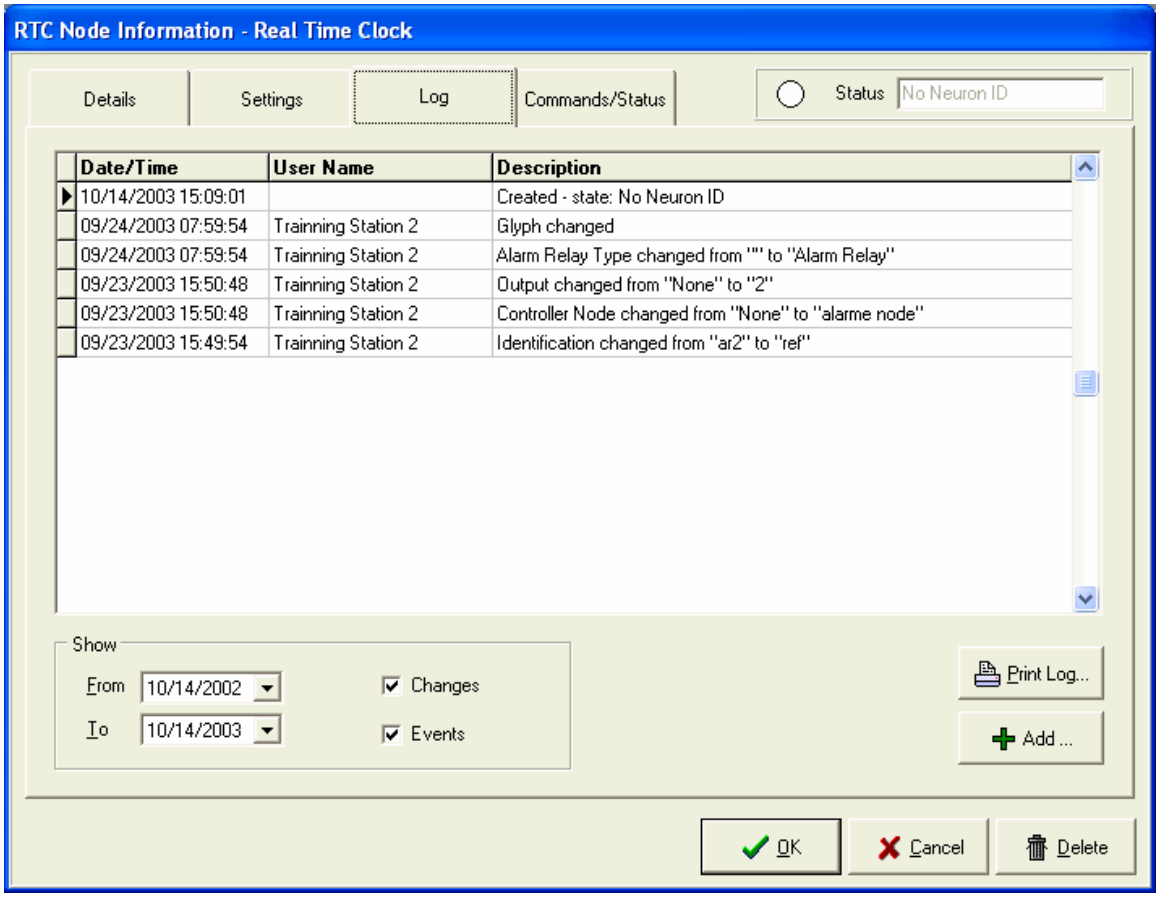
Give the Real Time Clock identification (e.g.: Real-Time Clock). Then click on the setting tab to move to the next step of the configuration.



The MT Alliance normally sends the time to all nodes in a single broadcast message at the "**Update Period**" specified above. If for any reason the PC is shut down or the MT Alliance is closed, the real-time clock will change from slave mode (listening and synchronizing with the PC) to master mode (broadcasting to all nodes) after 1.5 times the update period. So normally the real-time clock just listens and only very occasionally it will take over when the PC fails.

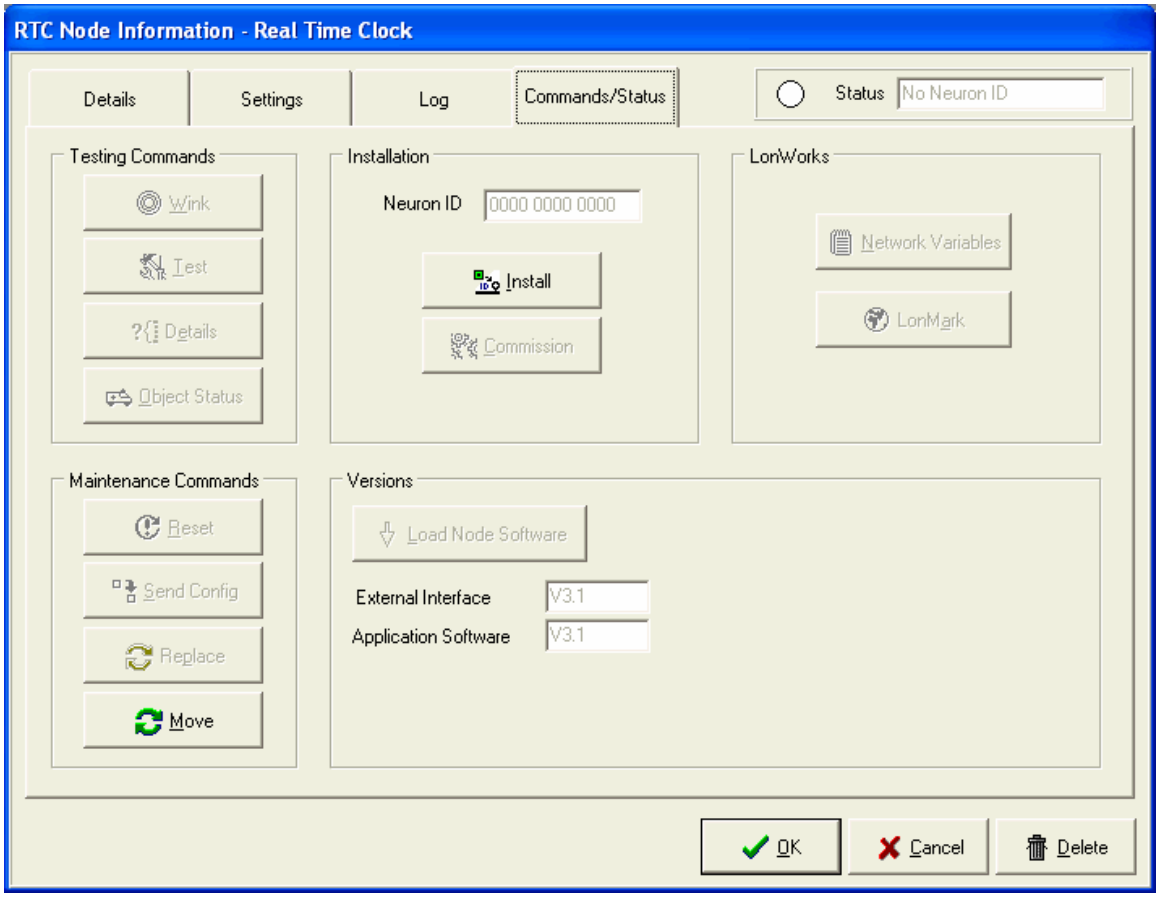
Select 'Daylight Set' if you want the RTC to automatically change from winter time to summer time while in master mode. The only alarm that the RTC can generate is a 'Battery Needs Service' alarm. Although shown on the user interface, the set time is not used. The RTC checks its battery every time the PC sends the time or every hour if the RTC is in master mode.

The recall time is used to generate another alarm later if the battery has not been replaced. Optionally you can select an alarm relay to energize when the battery fails. Come back later and select an alarm relay once you have dropped one.



The 'Log Tab' works the same on all components. It displays the date/time, user name and description of any change you make through the user interface. It also records events from the network such as the RTC resetting after power is applied or the 'Battery Needs Service' alarm. You can filter this log from a certain date to a certain date. You can display only changes made by users or events coming from the network or both. You can print the result of the filter and you can add a log item in the past, present or future.

But for now, the only important thing to do it to physically install the RTC, apply power, connect the data cable to the PC and install the node.



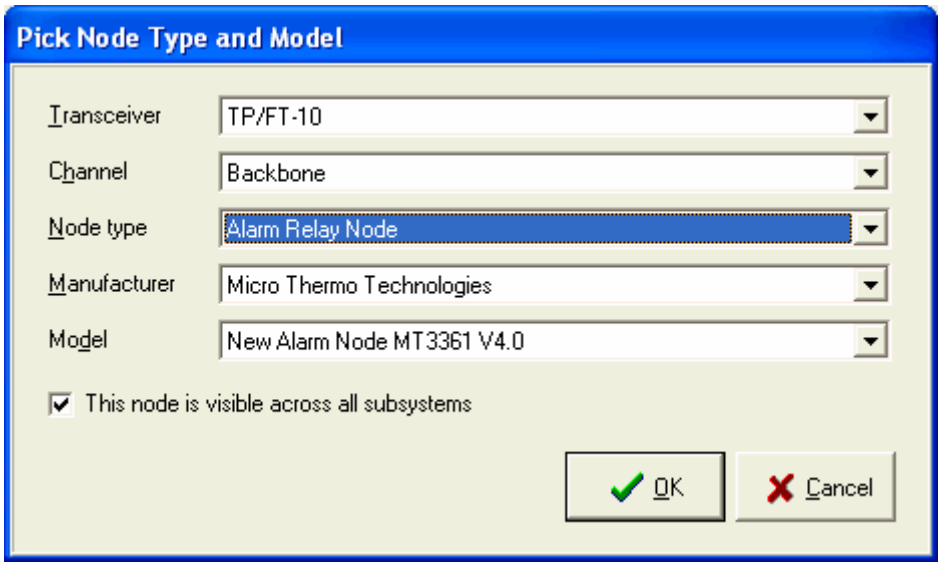
To install a node, simply click on the install button and the following window will appear on the screen.

Press the Service Button on the RTC node or manually enter the Neuron ID. The proper software then gets loaded in the node, the node is commissioned, connections are made and configuration parameters are sent. The node is now fully operational. All nodes install exactly the same way. For more information on the other buttons and when to use them, refer to the 'Volume 2: Node Installation'.

2.17 Dropping an Alarm Relay Node

Alarm Relay Nodes can be dropped globally or locally in a particular subsystem. Usually there is only one alarm relay node dropped and it is global. The MT Alliance will then connect all site nodes that can support alarms to the alarm relay node. In contrast, if you drop the alarm relay node locally in a given subsystem, the Alliance will only automatically connect all nodes in the same subsystem that support alarms to the controller node. Although the MT Alliance Software does not restrict the number of Alarm Relay Nodes that can be dropped, it is not recommended to drop more than 2. Without getting too technical, each time you drop one, you require resources in each node involved in the connection. These resources are then no longer available to perform other tasks. For example, if you were to drop 4 or 5 Alarm Relay Nodes, you would no longer be able to make some very important connections between rack nodes and you would end up with a non-functioning rack (until you remove the extra Alarm Relay Nodes that is).

So it is recommended to go into configuration mode first, select and possibly zoom on a global view and then drag and drop a node. The following window will appear:



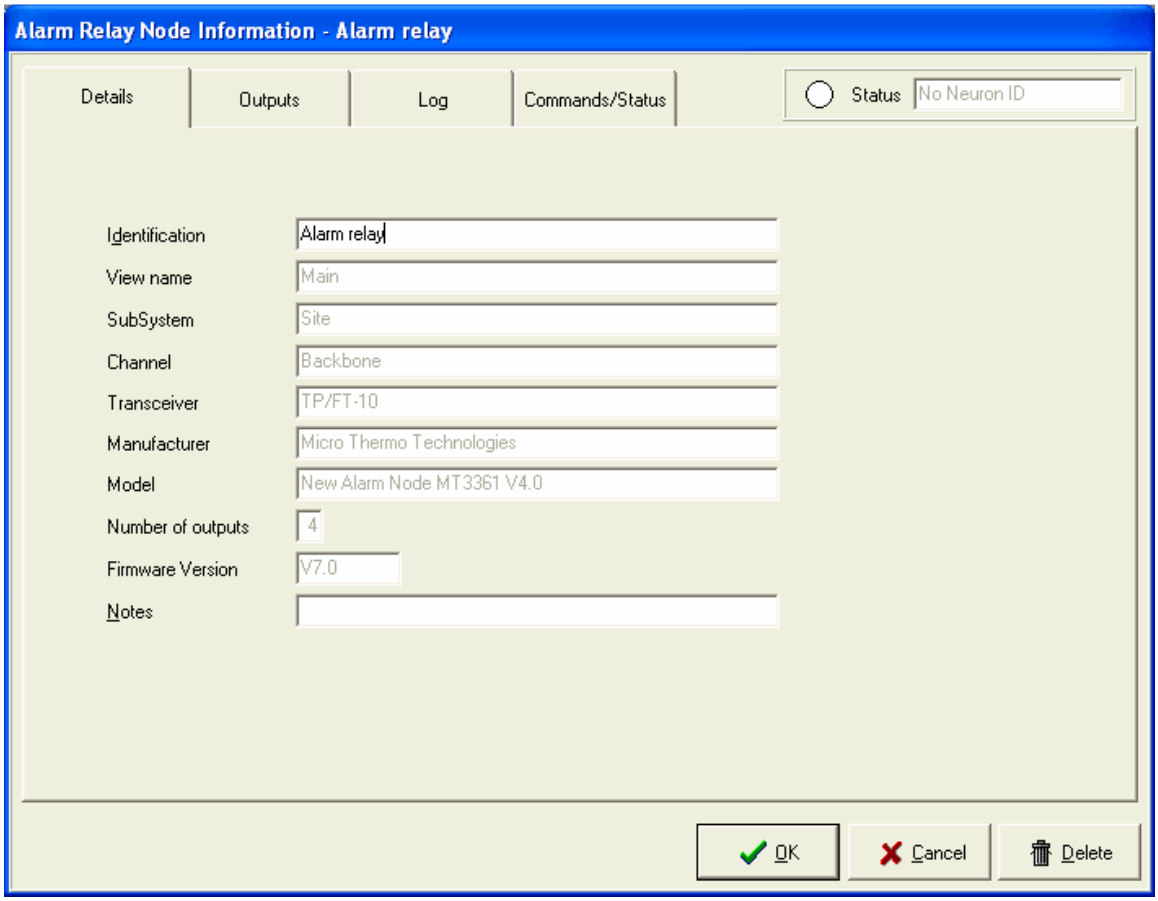
First specify the transceiver type of the Alarm Relay Node you have in hand. Then select the channel on which it will be installed. If routers are used, it is highly recommended that the Alarm Relay Node be installed on the backbone. This way, if a router fails, all nodes on the backbone or on the far side of all other routers will still be able to trigger an alarm relay. If you have a TP/XF-1250 backbone, be sure to order an Alarm Relay Node with a TP/XF-1250 transceiver.

The next step is to select 'Alarm Relay Node'. It is also a good idea to drop the Alarm Relay Node after the Real-Time Clock and before dropping other nodes. That is because the MT Alliance automatically connects all nodes that can generate alarms to the Alarm Relay Node when it is dropped. If you drop the Alarm Relay Node after all the other nodes, it will work but it may take several minutes before all the connections between all the nodes are made. The MT Alliance will look like it is frozen but it will in fact be working.

Then select 'Micro Thermo inc.' and 'New Alarm Node Vx.y'. Now here you have to be very careful. There are different generations of alarm nodes. The 'Internal Watchdog Node Vx.y' is no longer installed but remains for backwards compatibility reasons. That card was installed inside the PC to reset the PC when the MT Alliance stopped working properly or Windows itself froze. The 5 relays of the (external) alarm node now fulfill the same function.

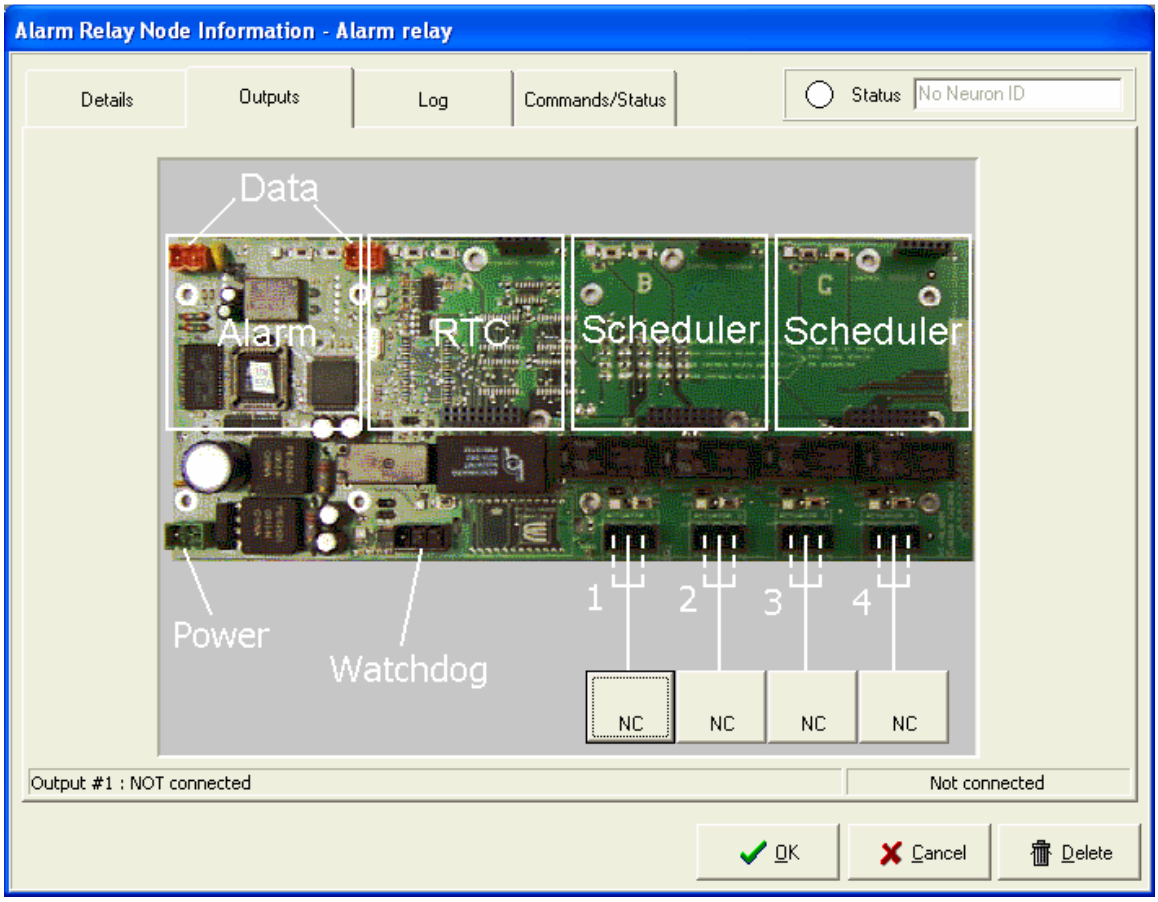
2.18 Configuring an Alarm Relay Node

Once you have dropped the Alarm Relay Node click on it to open the configuration window.



Give the Alarm relay Node identification. If the Subsystem is equal to "Site" then your Alarm Relay Node will be visible across all subsystems. Otherwise, it means that it is located in one particular subsystem. The number of outputs available corresponds to the number of Alarm Relay on the board. The fifth relay is always reserved for the WatchDog to reset the PC (no matter how many Alarm Relay Node you have dropped).

Once you are done, click on the "**Outputs**" tab.



It shows you which outputs are free and which outputs are used. You will be able to assign alarm relays to these outputs only after you drop the alarm relays. Assignment is bi-directional. You can come here and click on the outputs to assign an alarm relay or you go on the relay to select the alarm relay node and output.

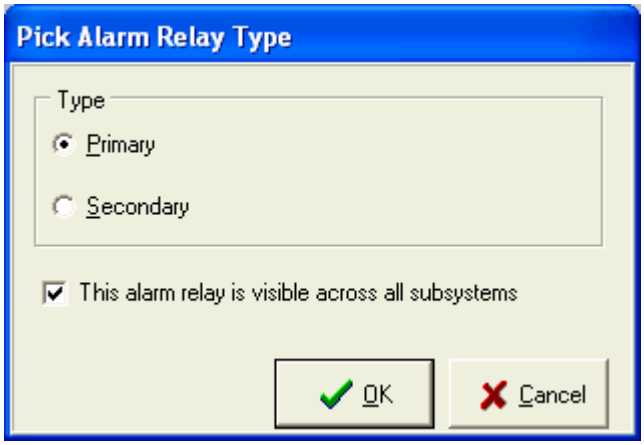
Install this node just like you install the real-time clock.

2.19 Dropping an Alarm Relay

A relay represents one output on an Alarm Relay Node. You can drop alarm relays to activate lights, buzzers, Alarm Company relays, etc.

You have to drop an alarm relay in the same subsystem as the Alarm Relay Node it is connected on. You can start the site configuration by dropping and configuring relays and later assign them to an alarm relay node. You can also assign them to nodes that have been logically dropped but are not yet physically installed.

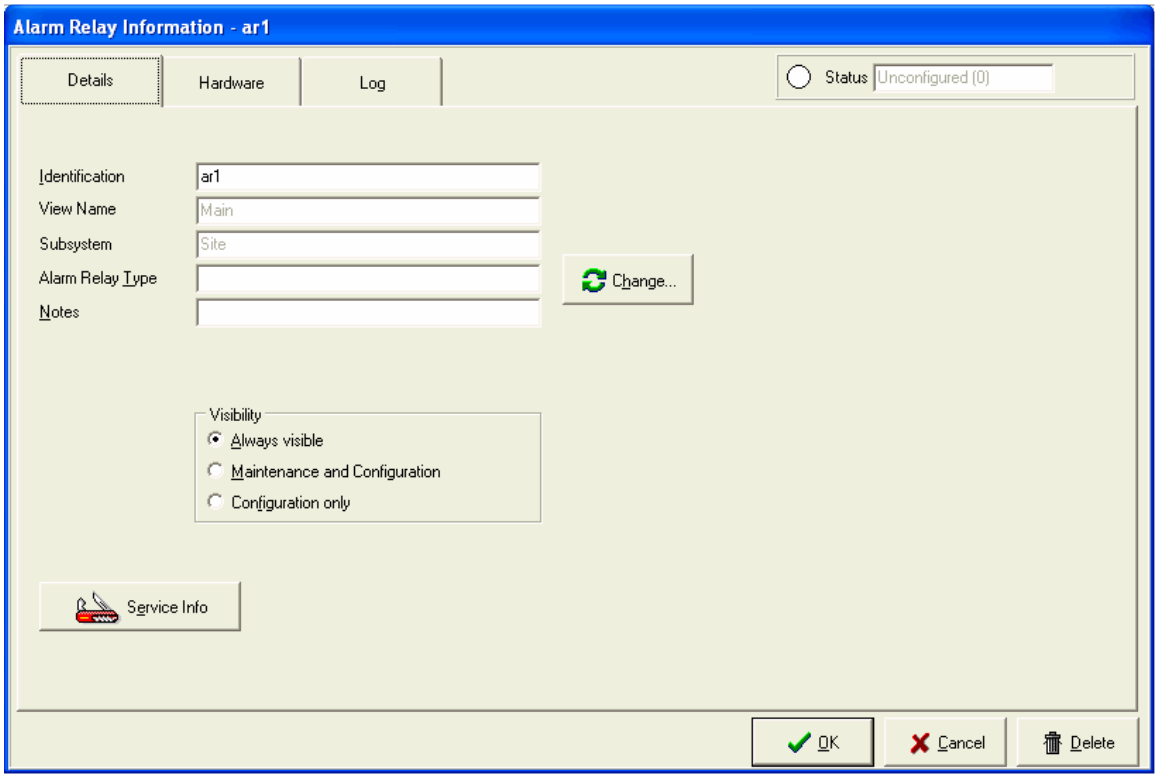
When you drop a relay you must specify if this will be a primary relay or a secondary relay. A secondary relay is like a copy of a primary relay. If the primary relay is active, the secondary relay will also be active. It is an easy way of duplicating relays. If you select a secondary relay, you will be asked to specify which primary relay it will mimic.



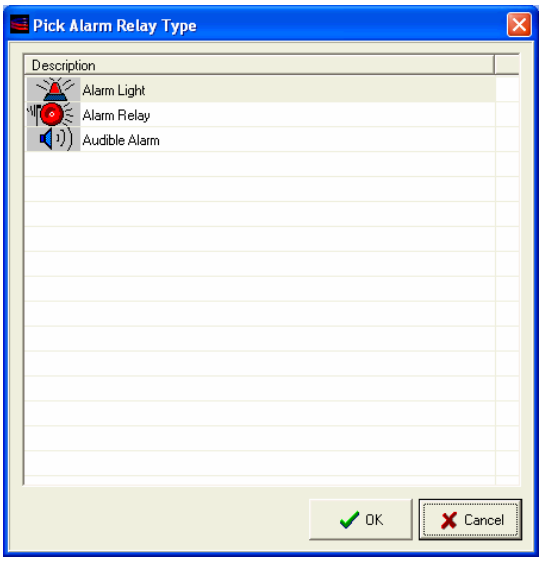
If you drop an alarm relay on a global view, you will be given the option to have this relay visible across all subsystems so it can be used by refrigeration nodes, HVAC nodes, etc. If you do not select 'visible across all subsystems', the relay will be local. It will belong to the subsystem in which it was dropped. You will only be able to assign it to a local alarm relay node. Global relays are assigned to global alarm relay nodes, local relays are assigned to local alarm relay nodes.

2.20 Configuring an Alarm Relay

It is now time for you to configure your alarm relay. Click on the one you dropped on main view to bring up the configuration window.



Give the relay identification (e.g.: ACT-1, Fresh Meat, etc.) A typical site usually has 4 relays so it is important to give meaningful identifications to them. Click on the 'Change' button to select a pre-defined relay type.

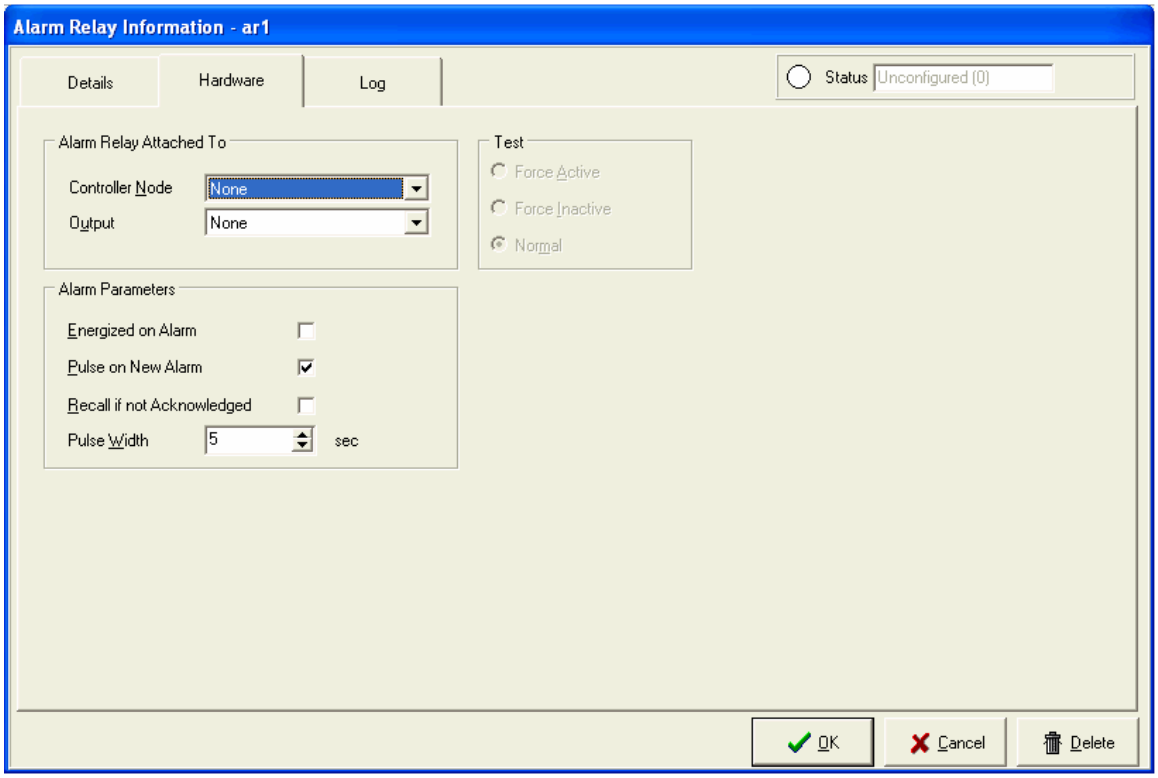


Click on an available item. This is selecting two bitmaps. The first bitmap is dedicated for active status and second one is for inactive status. When a relay is active it is shown in read. When it is inactive it is shown in green. If a relay is dropped on a zoomed view, it will appear as a triangle on the not zoomed view. A red triangle pointing up means the relay is active. A green triangle pointing down means the relay is inactive. A relay that is active represents one or more alarms. It represents a logical state and not a physical state (energized, normally open, normally closed, etc)

Now you can select the visibility of the relay according to the subsystem mode. If end users get too easily confused and think the relay is a point in alarm rather than an alarm notification mechanism, then show relays only in maintenance and/or configuration mode.

Use the 'Service Info' button to associate existing bitmaps of text files with this component. All bitmaps and text files must be located in the c:\Alliance\Images\Service directory.

It is know time to configure the Hardware part. To do so click on the "Hardware" Tab and the following window should come up.



You can now select the alarm relay node and the output where this relay is physically connected. In essence, you are telling the alarm relay node what you have physically wired on each output. If you cannot find a relay node in the list, then maybe the relay is global while the node is local or vice versa. Only available outputs (not already assigned to a relay) will be available for selection.

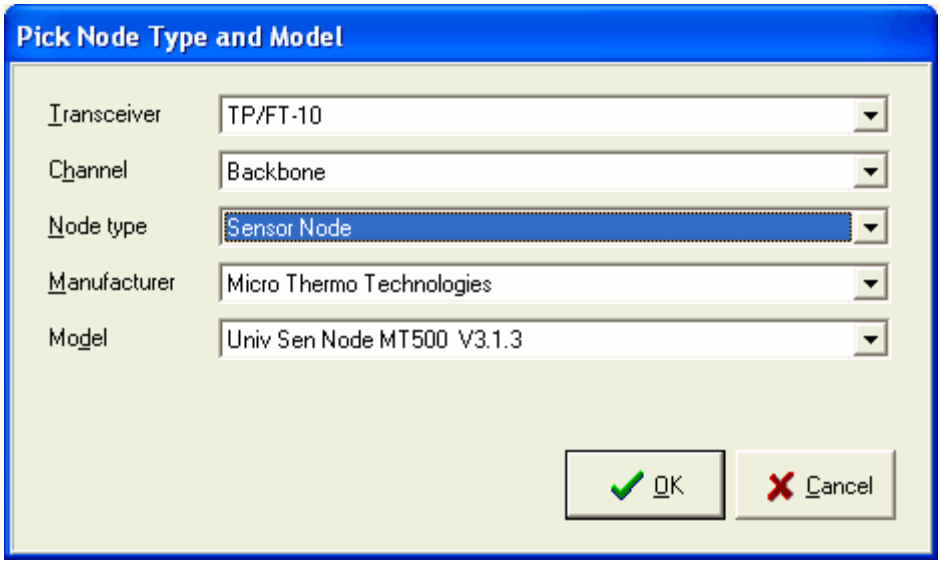
You will not be able to immediately test the relay. You first have to save your changes by clicking on the OK button. Click again on the relay and now you will be able to force it active or inactive or to ask for its normal present state (depends if nodes have generated alarms or not). Note that 'Force Active' or 'Force Inactive' statuses are not permanent. As soon as you close this window, the relay will go back to its normal state.

2.21 Dropping a Sensor Node

Sensor Nodes can only be dropped in a particular subsystem. Usually they are dropped in the Refrigeration Subsystem to measure case outlet temperature, coil inlet or outlet temperatures, product temperatures, etc. They can also measure and alarm on pressure, gas, power, power factor, current or switches. But they can also be dropped in any other subsystem if there is a need to measure and alarm on a point.

The MT Alliance will automatically connect a sensor node to all global Alarm Relay Nodes. It will also connect it to all local Alarm Relay Nodes in the same subsystem. You can drop as many Sensor Nodes as are required as long as you do not exceed the channel limitations. To drop more nodes, install more routers. Typically a given installation is limited to a total of 32, 64 or 256 nodes. If you need to install more nodes than you are allowed, contact Micro Thermo for a license upgrade.

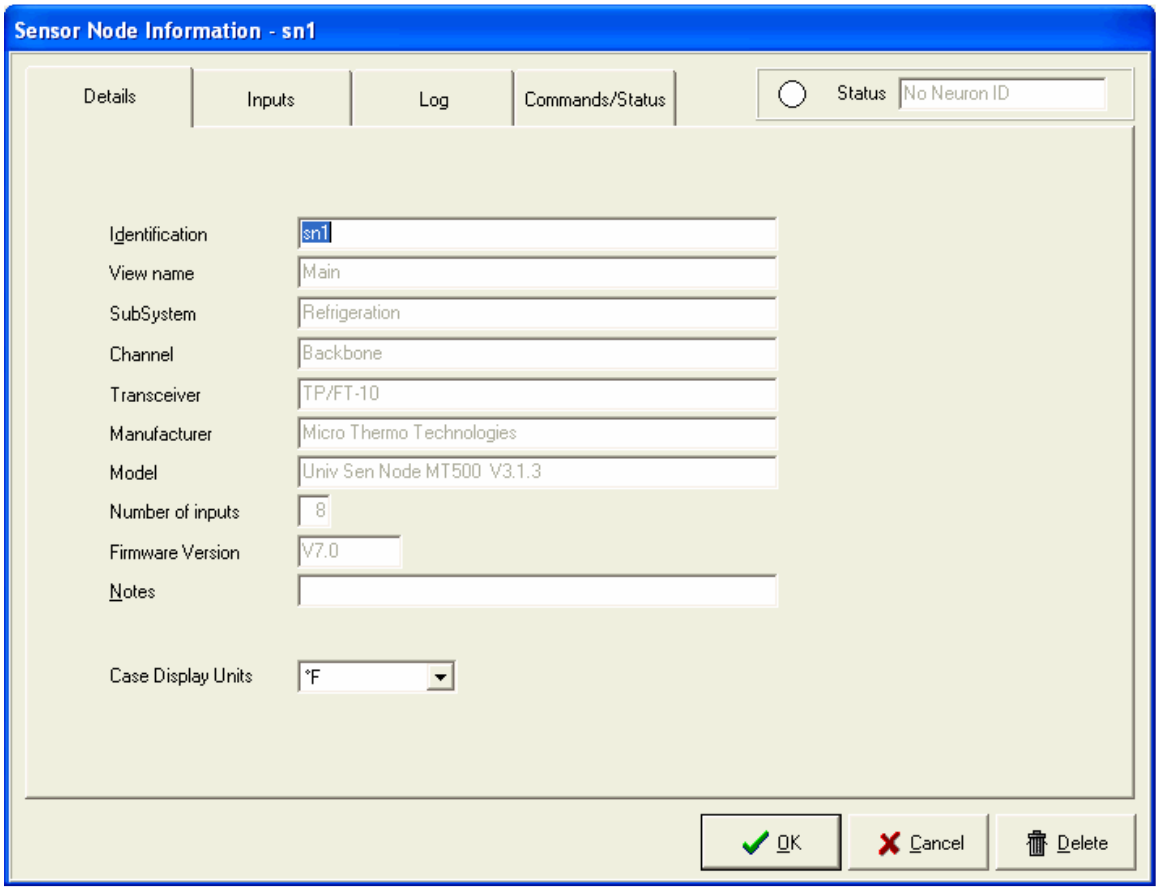
To drop a Sensor Node, go into configuration mode first, select and possibly zoom on a view and then drag and drop a node where it was physically installed. The following window will appear:



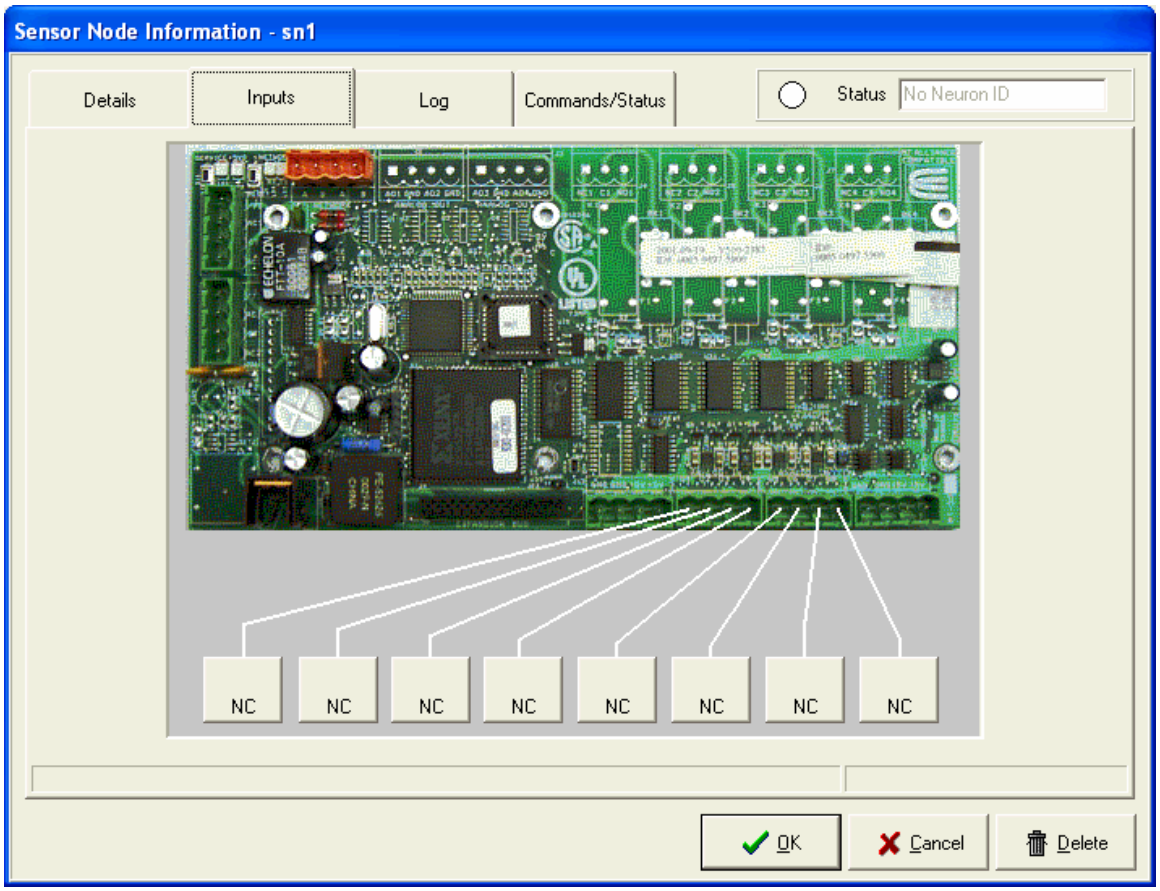
First specify the transceiver type of the Sensor Node you have in hand. Then select the channel on which it will be installed. The next step is to select a node type of 'Sensor Node'. The only available sensor node model is the Micro Thermo Universal Sensor Node Series MT500.

2.22 Configuring a Sensor Node

It is now time for you to configure your Sensor Node. Click on the one you dropped on main view to bring up the configuration window.



Give the Sensor Node identification. If you have a MT 500 plug-in module or/and a case displays module, you can select the temperature units on the display (Either Fahrenheit, Celsius or Kelvins).



The Sensor Node Inputs tab will look exactly like this. It shows you which inputs are free and which inputs are used. You will be able to assign sensors to these inputs only after you drop the sensors. Assignment is bi-directional. You can come here and click on the inputs to assign a sensor or you go on the sensor to select the alarm sensor node and input.

If you use dual case temperature sensors (explained later) you have to connect a dual use switch to one of the inputs. If the dual use switch and the primary sensor is located on the same node, then moving your mouse over one input will highlight the related input in blue

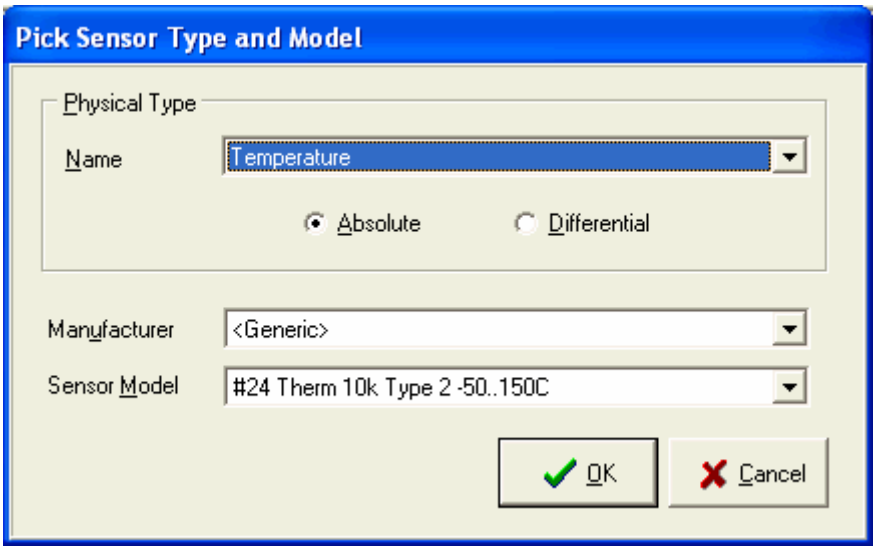
Install this node just like you install the real-time clock.

2.23 Dropping a Sensor

A sensor represents one input on a Sensor Node. You can drop sensors to measure temperature, humidity, gas, switch, pressure, power, power factor or current.

You have to drop a sensor in the same subsystem as the Sensor Node it is connected on. You can start the site configuration by dropping and configuring sensors and later assign them to a sensor node. You can also assign them to nodes that have been logically dropped but are not yet physically installed.

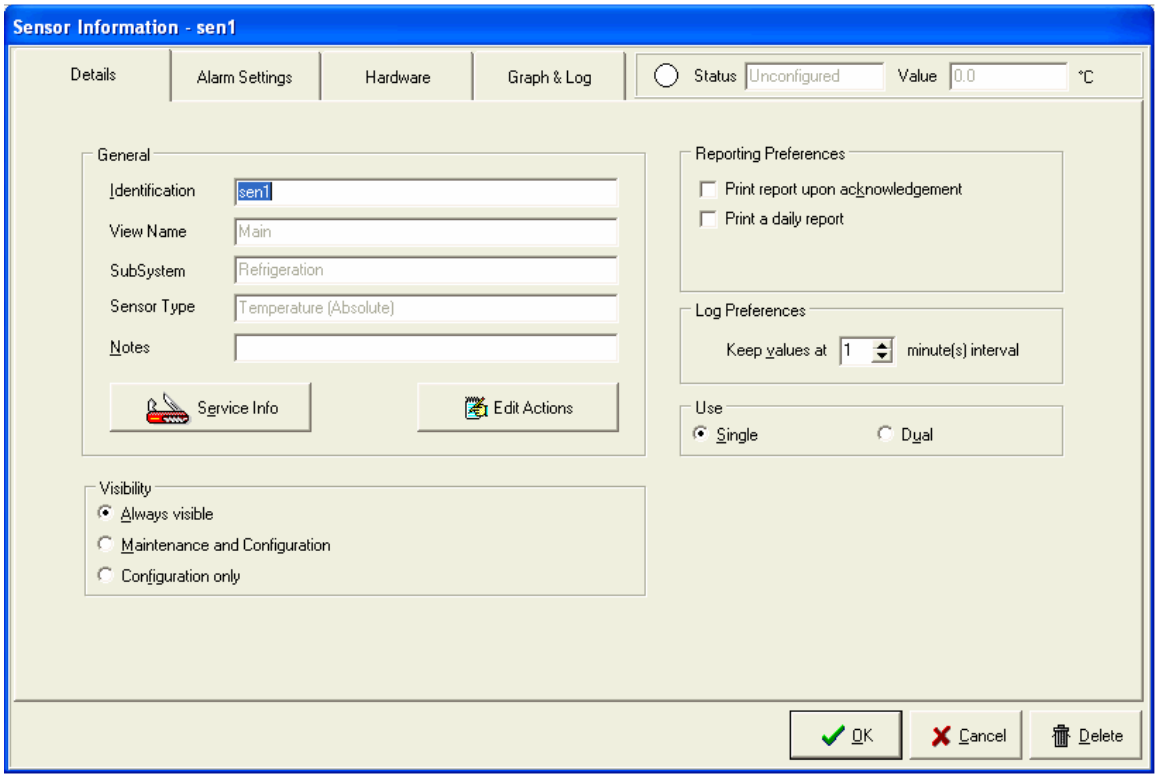
Usually sensors are dropped in the Refrigeration Subsystem to measure case outlet temperature, coil inlet or outlet temperatures, product temperatures, etc.



First pick the desired sensor physical type name (temperature, humidity, etc). Optionally select the manufacturer and sensor model at this point. The manufacturer and sensor model can be changed later. But once you have dropped a humidity sensor, you cannot transform it into a temperature sensor. If you choose the wrong sensor physical type, simply click on the sensor button and 'delete' the sensor.

2.24 Configuring a Sensor

After you dropped the sensor on your view, click on it to bring up the configuration window.



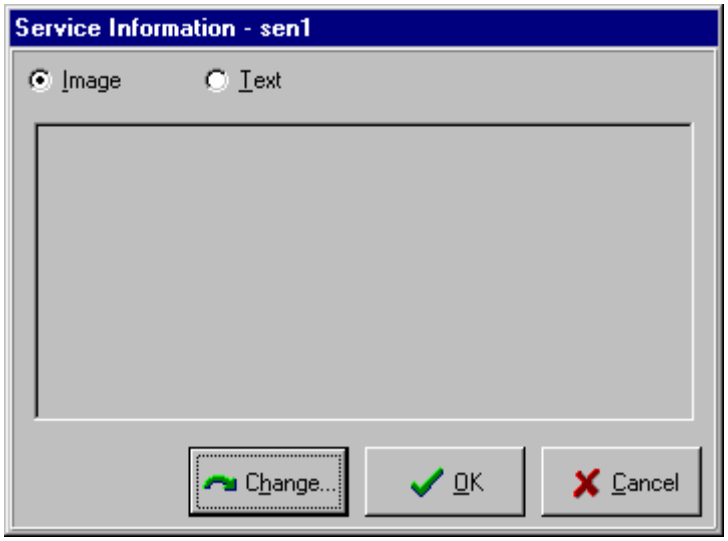
Give the sensor a unique identification. Then select the subsystem mode in which the sensor will be visible. You can select for this sensor to by default print a report upon acknowledgment. The user can override this default value when he acknowledges the alarm. You can also decide to automatically print a daily report for this sensor. The daily graph can also include a textual log of the events associated with the sensor during this day (not shown here). Daily graphs usually start printing around 3 AM (this can be changed). The graph printed always covers the previous day. So it is normal that daily graphs are not printed on the day it is installed.

Select the number of minutes between historical data logging for this point. The default value of 1 minute is adequate in most cases. If the number of points that the MT Alliance must collect is too large (more than a few thousands of points), then the PC may not be fast enough to save all data points every minute. In this case, the MT Alliance will treat all points with the same importance (e.g.: every point will be saved every 73 seconds).

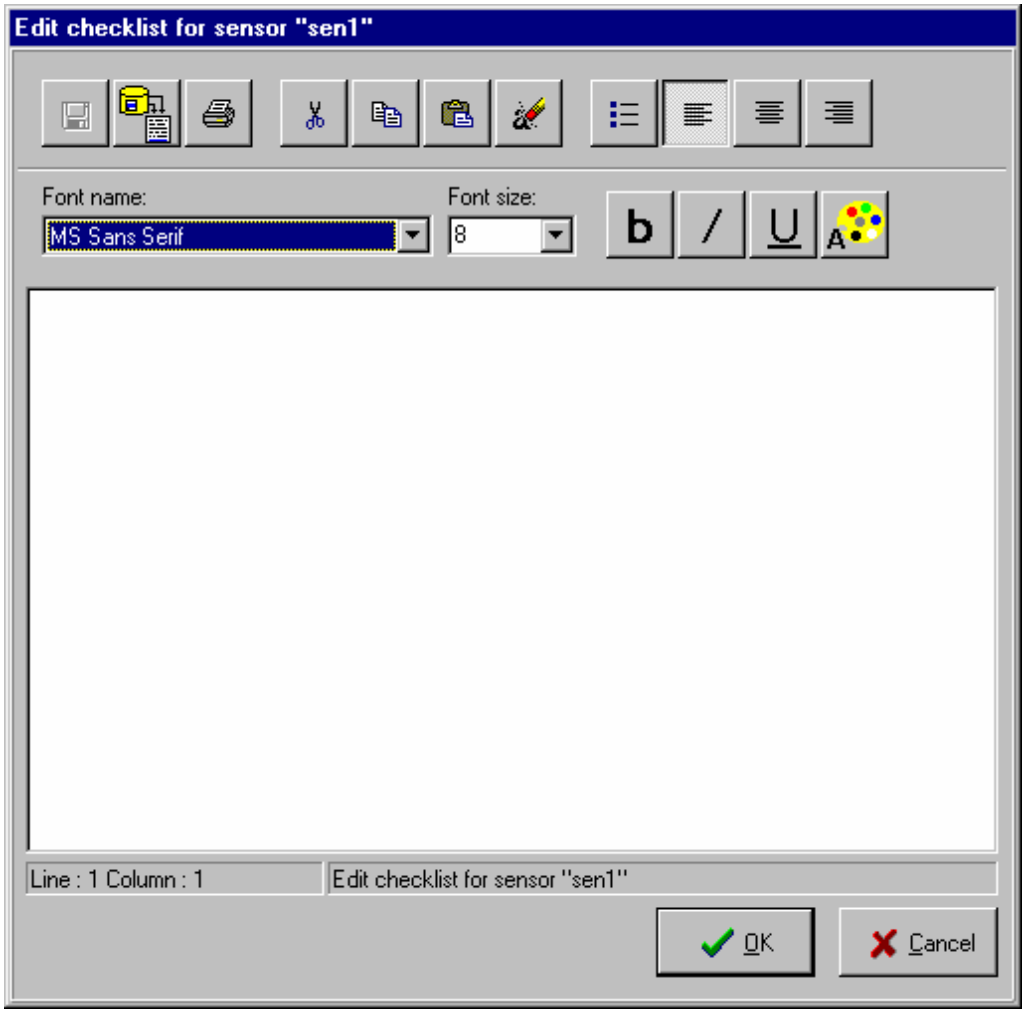
If you know for a fact that certain types of points are not worth saving every minute, then increase the value. The maximum period is 60 minutes (24 savings a day for a point).

If this is a dual use sensor, then select dual use otherwise select single. Dual use sensors use two sets of limits. When the associated dual use switch is in one position, the first set is used. When the switch is changed, the second set is used. This feature is mostly use in island cases for dual temperature cases. A dual use switch can be shared by many sensors.

The Service Info button can be used to attach a bitmap or a text file to this sensor. Note that bitmaps or text files must already exist in the c:\Alliance\Images\Service directory before you can use this feature. You cannot edit the service information here, you can only select it. If this point is representing a case temperature, then it is a good idea to attach a picture of the case itself and a text file containing the case specifications such as : recommended number of defrosts per day, case load, etc. To change the image, click on the 'Image' radio button then click on 'Change'. To change the text file, click on the 'Text' radio button and then click on 'Change'.

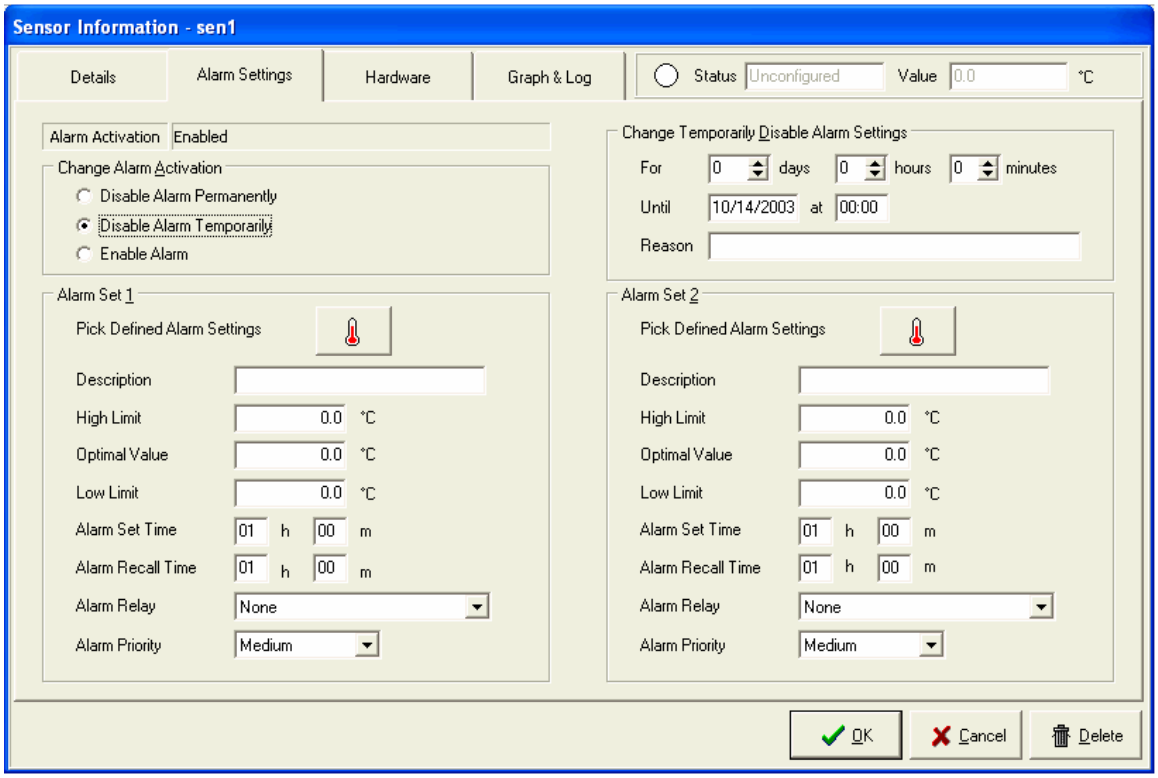


Each sensor has an associated checklist. The checklist is a list of actions presented to the end users when they attempt to acknowledge the sensor that is in alarm. Checklist templates can be pre-defined so that you can reuse them from sensor to sensor.



Here you can type text, cut, copy and paste text, add bullets, change the paragraph alignment, use bold, italic or underlined text or change the text color. This rich text format will be presented as is to the end use upon acknowledgment.

The next step of the configuration is to define your alarm settings. In order for you to do this, click on the "Alarm Settings" tab.



The first thing to do is to pick a pre-defined alarm setting (which you can change but not from here). Once you have selected a pre-defined setting, it will automatically fill the description, high limit, optimal value, low limit and alarm set time. The other fields (recall time, Alarm relay and priority) are not affected by your choice. You can override any of the automatically filled fields with different values afterwards. Just be aware that clicking on the 'Pick Defined Alarm Settings' button will put back pre-defined values into these fields.

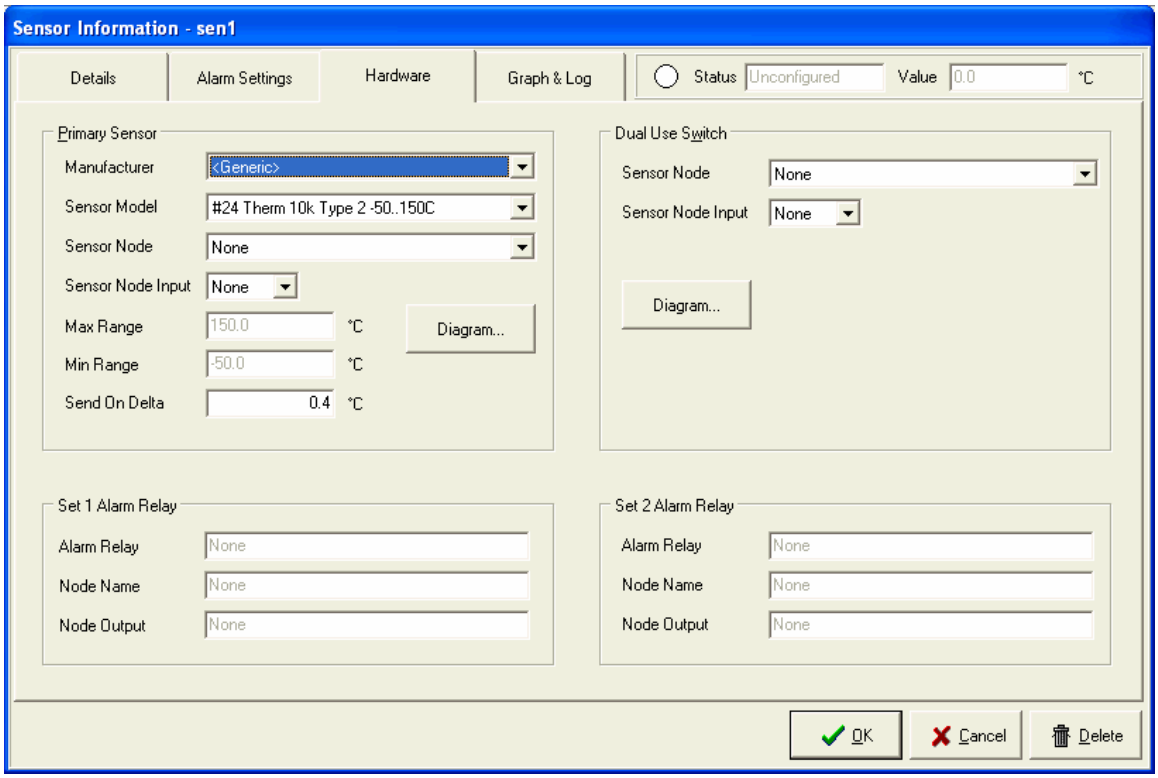
Refer to 'Volume 1: MT Alliance User's Manual' for a more detailed explanation of refrigeration alarms. Select a global alarm relay or an alarm relay in the current subsystem if you need to activate a alarm relay when this sensor becomes in alarm. Select a priority of low, medium or high if you have chosen an alarm relay. Without an alarm relay chosen, only the PC can display the alarm. In this case you can also select an alarm priority of 'notice' which is lower than 'low'.

Usually you will enable alarm monitoring for this sensor. But if you never want any alarms, you can do two things. The first is to select ridiculously high values for the high limit or ridiculously low values for the low limit. Another way is to disable alarms permanently on this sensor (it will be shown in light blue). If a case is being cleaned for example, you may want to disable alarms temporarily instead of getting a new alarm after the recall time. You can disable alarm temporarily for up to about 21 days. Notice that this information is stored into the node non-volatile memory. It will be lost if the sensor node is reset (software reset, reset pin or power-up reset). In this case you will get an alarm even if the MT Alliance is still showing the sensor as temporarily disabled.

If you enter a reason for temporarily disabling alarms, it will be shown to other users when they click on the sensor. Only the latest reason is kept however.

The second set of limit is shown only if you have selected 'dual case use'. Notice that you can select a different alarm relay and priority in this case. When the sensor is fully configured and its dual use switch as well, the currently active set of alarm limits will be shown in bold.

The "Hardware" tab look like this:

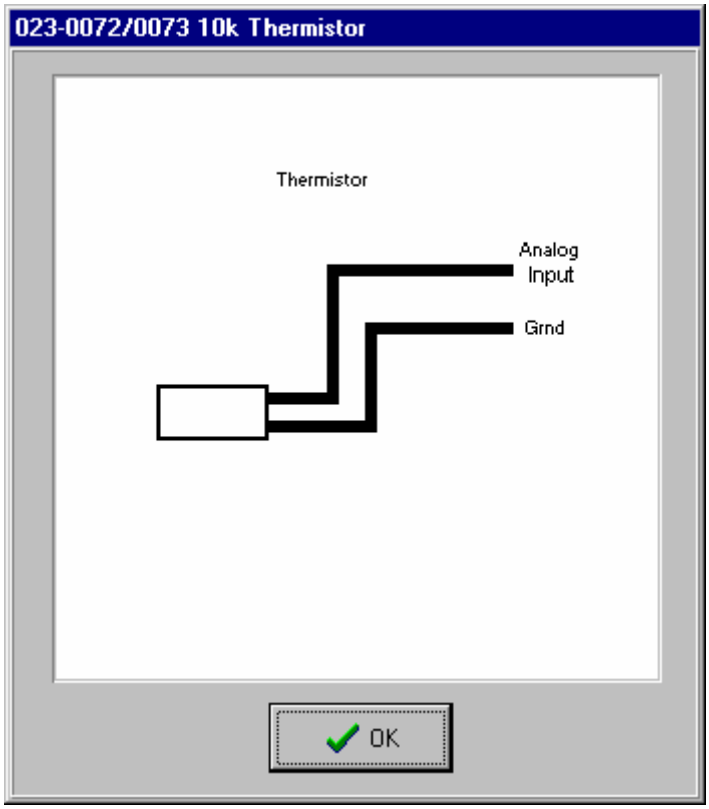


Even after the sensor is dropped, you can still change the manufacturer and sensor model. New manufacturers or sensor models can easily be added. You do have to contact Micro Thermo for this however. That is because the list of all supported sensor models is a standard list for all Micro Thermo sites. Each new sensor model must be assigned a unique key by Micro Thermo otherwise future site upgrades will not be possible.

Here you can select the sensor node and the input on which this sensor has been attached. Leave the 'Send on Delta' value as is. You are supposed to increase this number if you notice that the sensor is unusually noisy. If it is changing very often (by more than the delta value) it will be transmitted on the LonWorks network to the PC. That can create unnecessary traffic on the network. Noisy sensors can be the result of a bad batch from the manufacturer (unlikely), or using sensor wires that are too long or not of the recommended types, or spliced cables not well protected against humidity, or passing the sensor cable to close to switching power supplies, transformers or ballasts. Increasing the delta should be considered a temporary remedy rather than a long term solution.

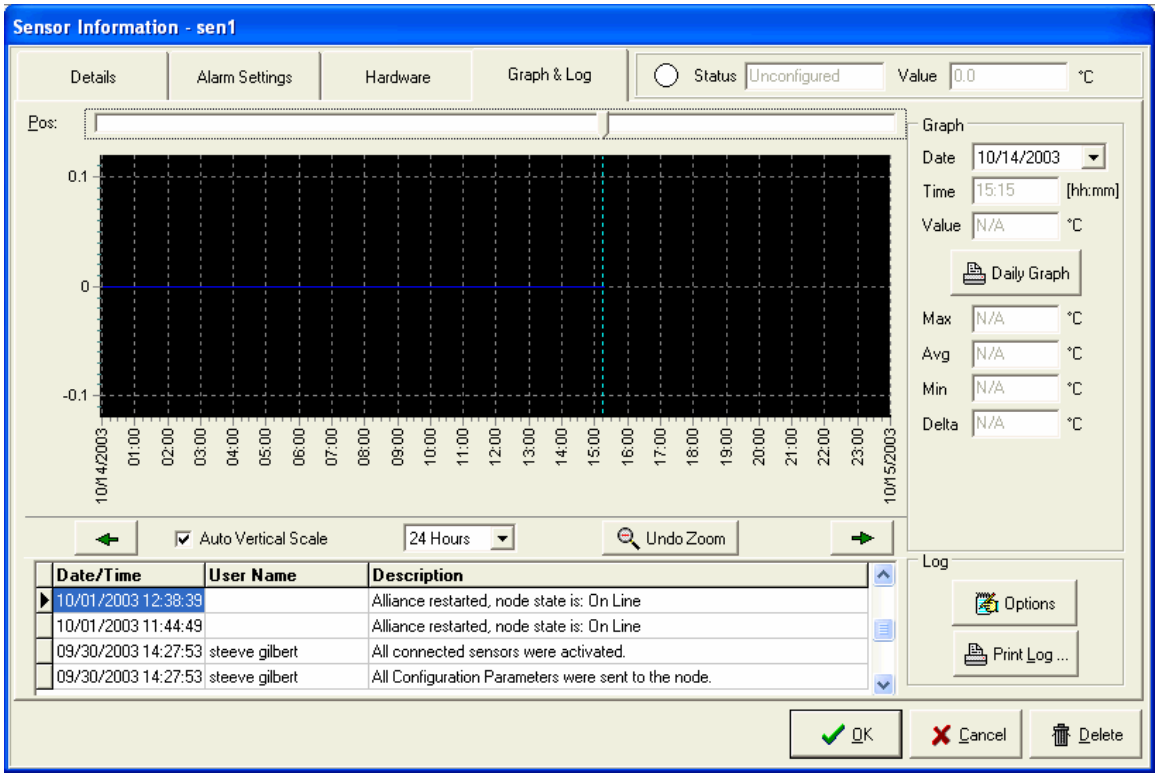
The 'Dual use switch' group will be shown only if you have selected a dual use sensor. Here you can select the alarm sensor node and input where the dual use switch was attached. Be careful because dual use switches can be shared. Inputs with existing dual use switches will be available for selection.

The diagram button is there to show you how to connect the primary sensor or the dual use switch. For example:



This shows that the Thermistor is a polarity insensitive device (unmarked wire) that you connect between one analog input and the signal ground.

Please refer to "Volume 1: MT Alliance User's Manual" for more information about the graphing and logging features of the MT Alliance. Here is an overview of what the "Graph & Log" tab looks like.



2.25 Dropping a Custom Node

Sensor nodes, sensors, alarm relays nodes, alarm relays, real-time clock, routers and schedulers are automatically managed by the MT Alliance Platform so that the installation time is minimized. This simplified approach does not allow a lot of flexibility. The purpose of a custom node, its associated custom points and MT plug-ins or LNS plug-ins is to add a lot of flexibility but at the expense of simplicity. The new power provided to solve just about any control problem brings with it the LonWorks technical jargon. Now you need to know what network variables are and how to connect them.

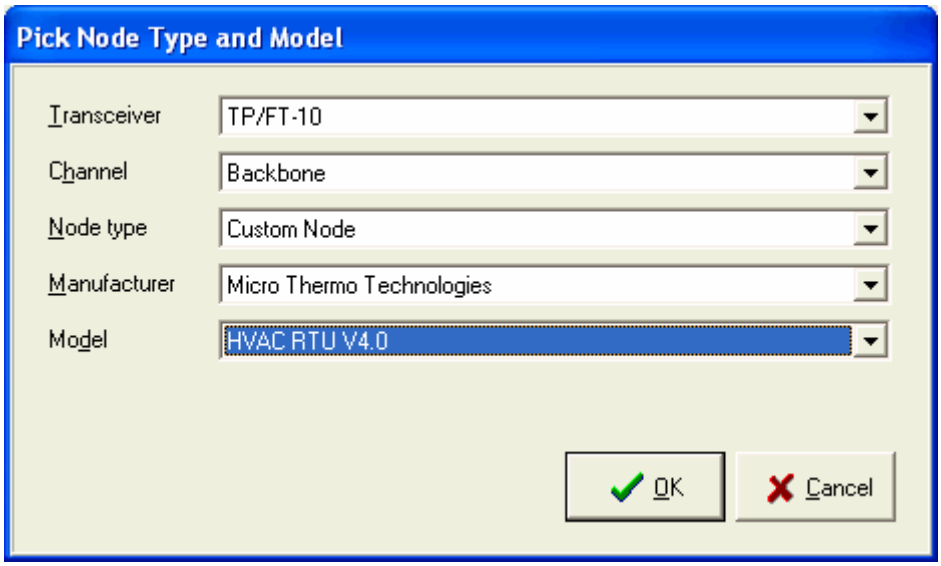
Micro Thermo has also made use of this approach to provide a quick time to market solution to new features. For example, the refrigeration configuration tool automatically creates a user interface within the MT Alliance Platform by generating custom nodes, custom points and MT plug-ins. The HVAC control nodes or secondary cooling control also makes use of custom nodes. In time, they will also be replaced by a completely new user interface.

The coming paragraphs will show you how to make use of the powerful features of the custom approach. Before you start using a LonWorks node or even a LonMark certified node, you should be aware that any new node software must be approved by Micro Thermo before it is installed on a site. Failure to do so may result in severe malfunctions in the rest of the system. Micro Thermo may ask at its discretion for the physical removal of any unapproved node before providing technical support to a site.

Enough said, let's drop a custom node. Just like sensor nodes, custom nodes can only be dropped in a particular subsystem. The MT Alliance will perform a certain level of automatic support for custom nodes as well. Any node that can generate alarms in the standard LonMark way (through nvoAlarm on node object 0) will automatically be connected to all global Alarm Relay Nodes. It will also connect it to all local Alarm Relay Nodes in the same subsystem.

You can drop as many Custom Nodes as are required as long as you do not exceed the channel limitations. To drop more nodes, install more routers. If you need to install more nodes than you are allowed, contact Micro Thermo for a license upgrade.

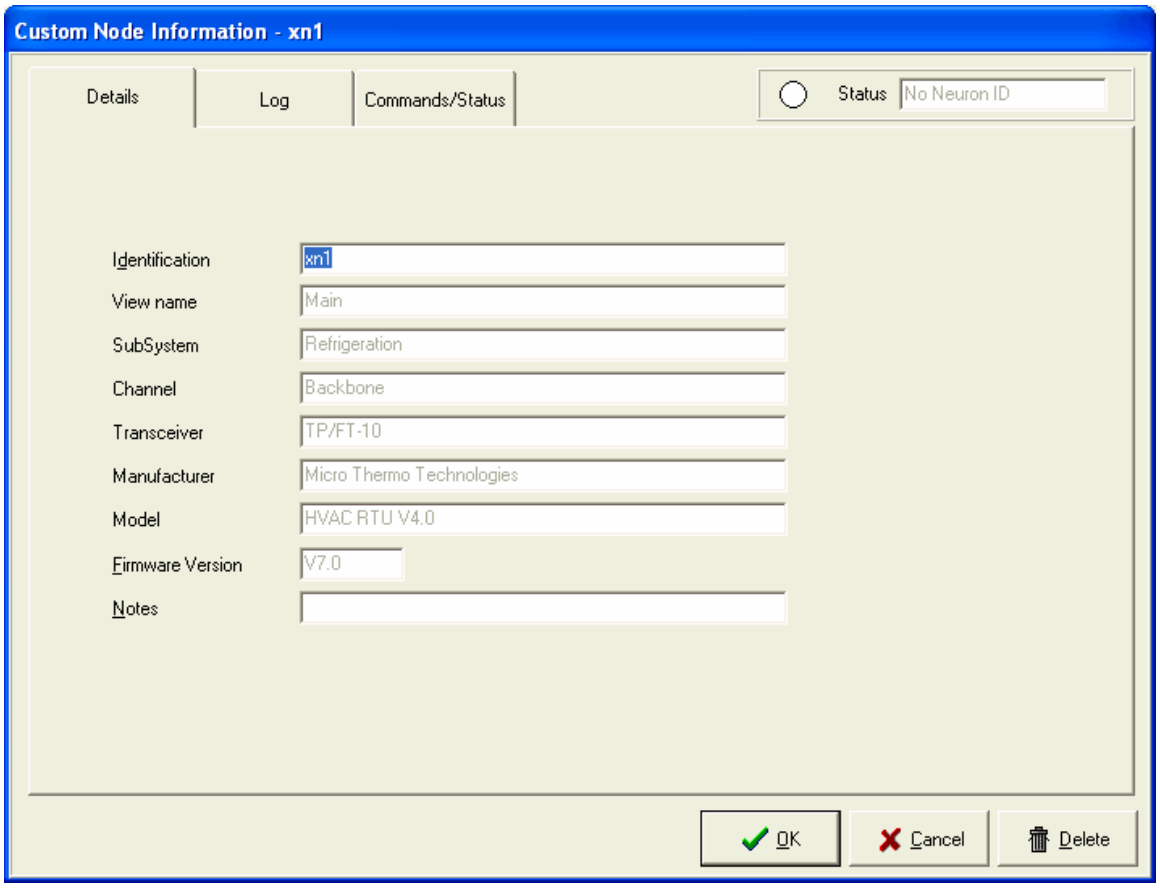
To drop a Custom Node, go into configuration mode first, select and possibly zoom on a view and then drag and drop a node where it was physically installed. The following window will appear:



First specify the transceiver type of the Custom Node you have in hand. Then select the channel on which it will be installed. The next step is to select a node type of 'Custom Node'. Then select a manufacturer and model that corresponds to what you want to do. All nodes approved by Micro Thermo are automatically distributed on a new site. If you have to install a node that is not in this list, contact Micro Thermo.

2.26 Configuring a Custom Node

Simply click on the Custom node button you just drop to bring up the configuration window.



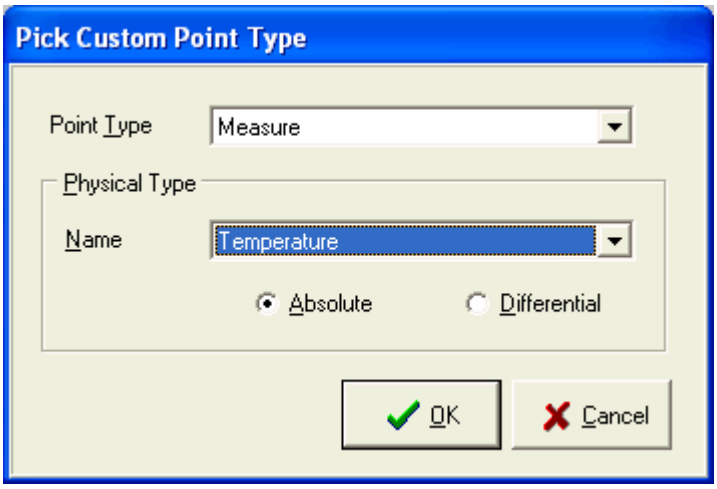
Give the custom node a unique identification. The 'Log' tab and the 'Commands/Status' tab work the same way as with any other nodes. Notice that there is no additional tab in this case because the MT Alliance does not know what the functionality of the custom node is.

Install the node like any other node.

2.27 Dropping a Custom Point

A custom point can represent three things. A command point is a value that is transmitted from the PC to a custom node. Usually it is used to transmit a setpoint. A measure point is a value that is transmitted from a custom node to the PC. It is used to create a historical log of that point. Finally a Command/Measure point is a combination of both features on a single button.

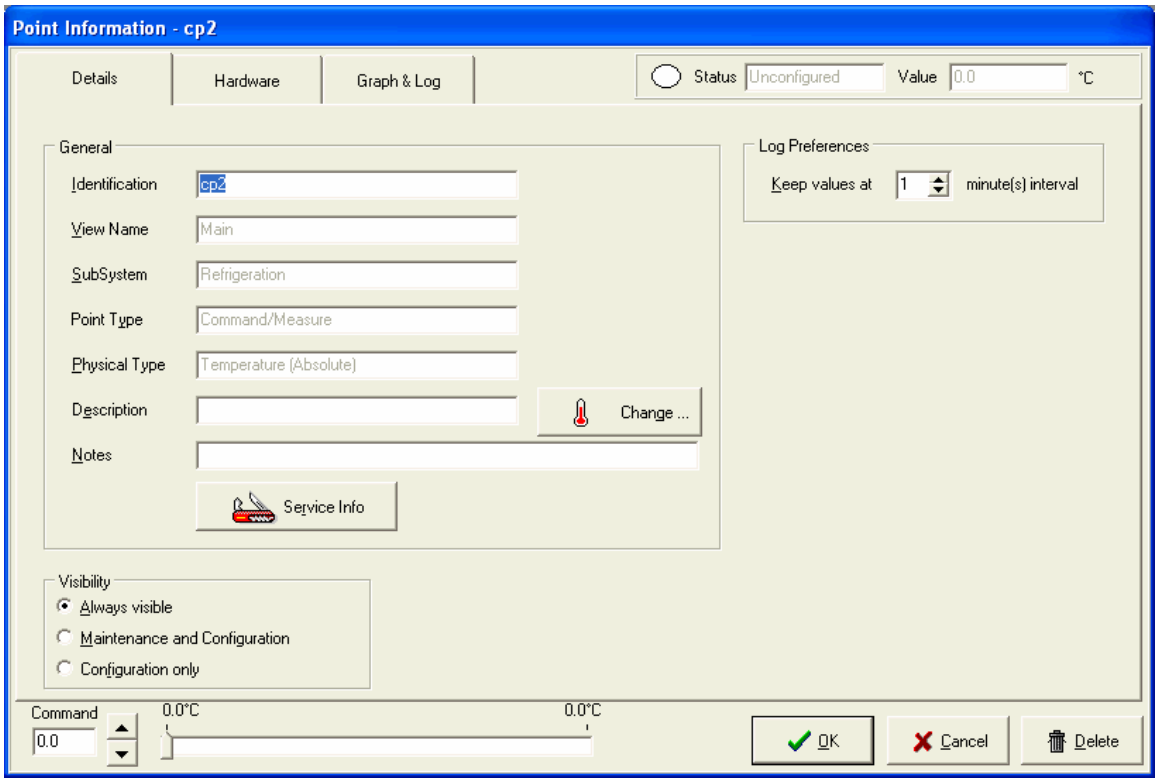
You have to drop a custom point in the same subsystem as the Custom Node you want to associate with it.



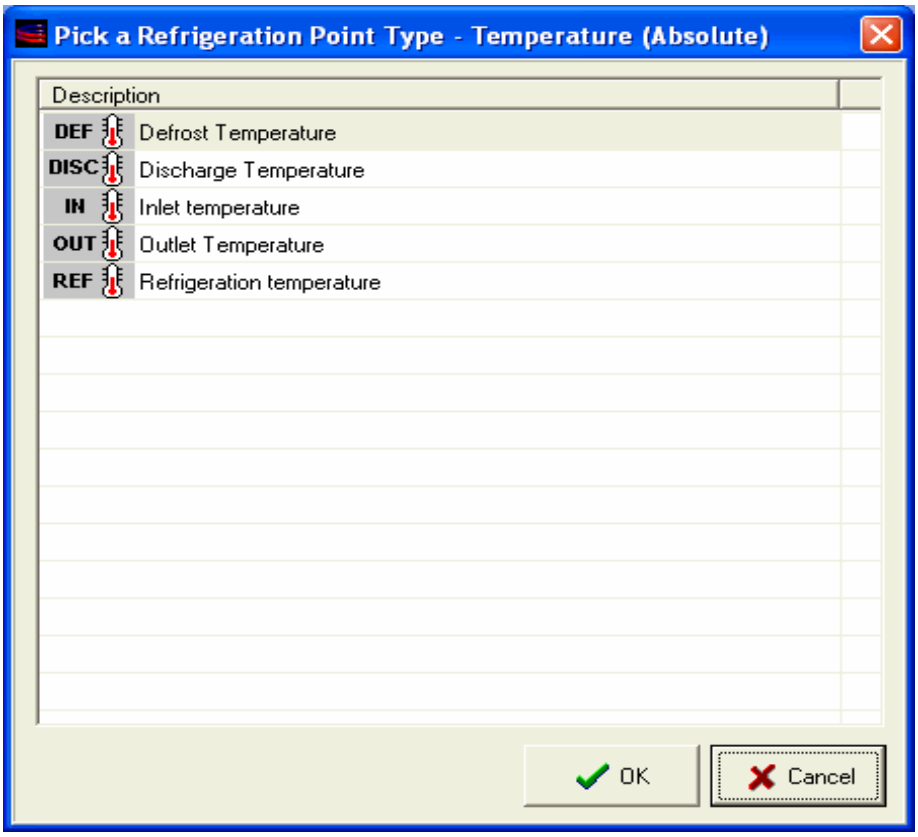
First select if this will be a command point, a measure point or both. Then select the desired physical type (temperature, humidity, etc). Once you have dropped a custom point, you cannot change the point type or the physical type. If made a wrong selection, simply click on the button and 'delete' the custom point.

2.28 Configuring a Custom Point

Now click on the button that represents the custom point. Depending on which point type you have chosen, a window will come up. We will show here what a command/measure point looks like:



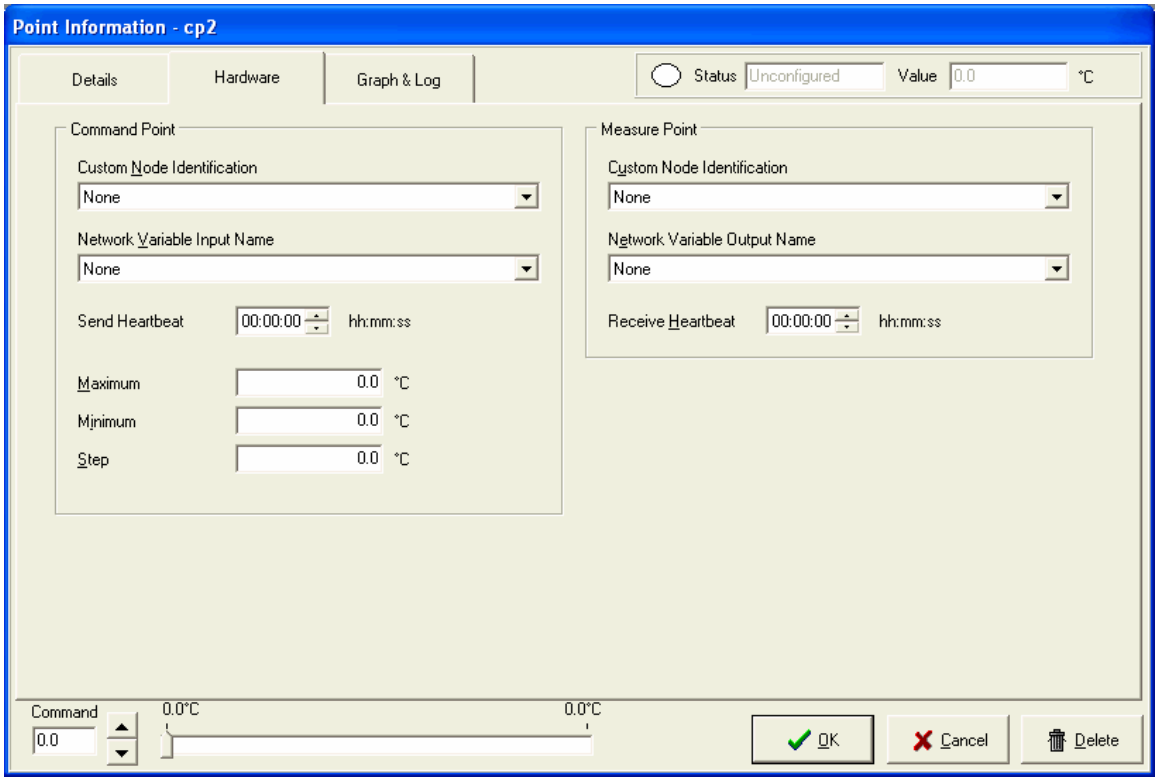
First give the custom point a unique identification. To change the glyph on the button and insert a description, click on the 'Change' button. Depending on the current subsystem and the physical type of the point, you will be presented with default choices such as the ones below:



Note that the 'Change' button will overwrite the description field with your choice. Just like sensors, you can associate a service information bitmap or text file with this particular custom point. Just like sensors, you can increase the save interval. Just like sensors, you can select the button visibility according to the subsystem mode.

The only difference between sensors and custom points is that a command or a command/measure point will have a command field and slider at the bottom of the window.

The hardware tab is only visible in maintenance or configuration mode. It looks like this:



A Command Point sends a value on a network variable input (nvi) on a custom node. A Measure Point reads a value on a network variable output (nvo) on a custom node. A Command/Measure point does both. The node where the command is sent can be different from the node where the measure is read. So select the destination node and nvi name and the source node and nvo name.

For a command point, you can then select the range of the command slider. Simply specify the maximum value of the slider, the minimum value of the slider and the slider steps. Command points are transmitted to the node every time the Alliance starts. It is also transmitted each time the node is reset or the node software is loaded. You can also select to transmit periodically a command point by setting the send heartbeat value to something different than 0. This is useful for nodes that have a receive heartbeat on their nvi. After a time has elapsed, if they have not received a value from the PC, they will invalidate the nvi and revert to some other value (a built-in default value for example). Please note that the send heartbeat feature from the PC to a custom node is not extremely fast. It is also not very accurate for values less than a few minutes. So use this feature only when required.

A Measure point can have a receive heartbeat. This means that if the node does not transmit its nvo within the specified time, the MT Alliance will invalidate the value. It will paint the custom point in black to indicate that no value has been received for a while. For this feature to be effective, the receive heartbeat must be set to at least 3 times the output period of the node. Even then, when you perform long operations such as loading new software in a node, you may temporarily have custom points that are painted black. A value of 5 to 10 minutes is more reasonable. You can use 'receive heartbeat' to visually see which points are not getting refreshed as they should. So if a node is defective, its associated points will turn black.

The 'Graph and Log' tab is identical to the one used by the sensors.

2.29 Dropping a Plug-in

A Plug-In is a Specialized User Interface usually associated with a custom node. Its primary purpose is to configure a custom node with a user-friendly interface. It allows real-time monitoring and control of a node, allowing you to see alarms, to bypass inputs or override outputs.

Plug-Ins currently have two major limitations. They cannot keep historical data and they cannot make network variable connections between nodes. This means that in order to collect historical data about a process controlled by a custom node, you still have to drop custom points on a view. And if you want custom nodes to share information, you have to make these network variable connections manually.

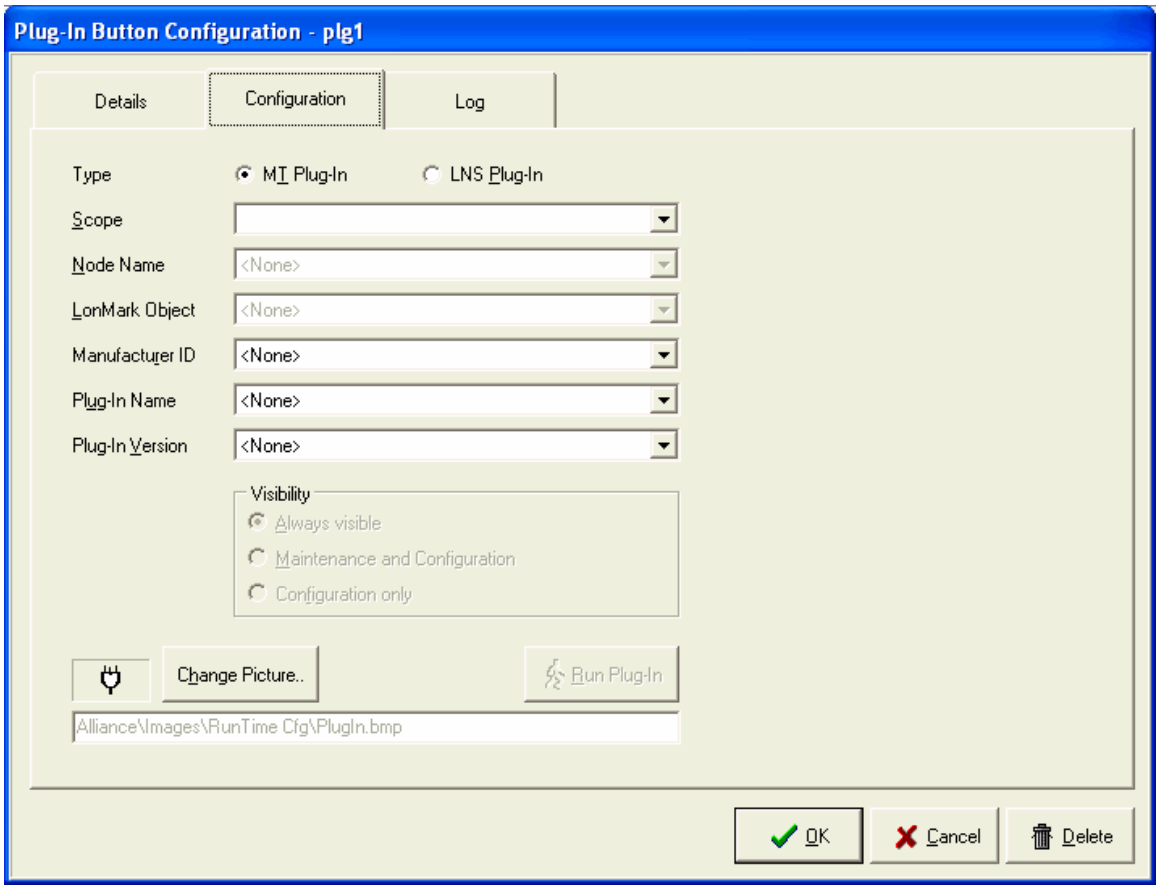
There are two types of plug-ins: LNS plug-ins and MT plug-ins. LNS Plug-ins are usually provided by the node manufacturer. The LNS Plug-Ins concept was developed by Echelon. The node manufacturer does not have to adapt to the MT Alliance. LNS Plug-Ins will run on any LNS platform that supports the plug-ins. This incredibly powerful and seamless interoperability comes at a price however. LNS plug-ins takes longer to open and to close.

MT Plug-Ins are developed by Micro Thermo. They usually support nodes manufactured by Micro Thermo (e.g.: rooftop unit, dual path unit, secondary cooling, etc.). But Micro Thermo has also developed MT plug-ins for other manufacturers such as GenTec. MT Plug-ins open and close faster. They know the current subsystem mode they are in and they can adjust the user interface according to the mode.

Before dropping a plug-in, select the desired subsystem and go into configuration mode. When you drop a plug-in the plug-in button appears immediately.

2.30 Configuring a Plug-In

When you first click on the button that represents your plug-in, the plug-in information window comes up.



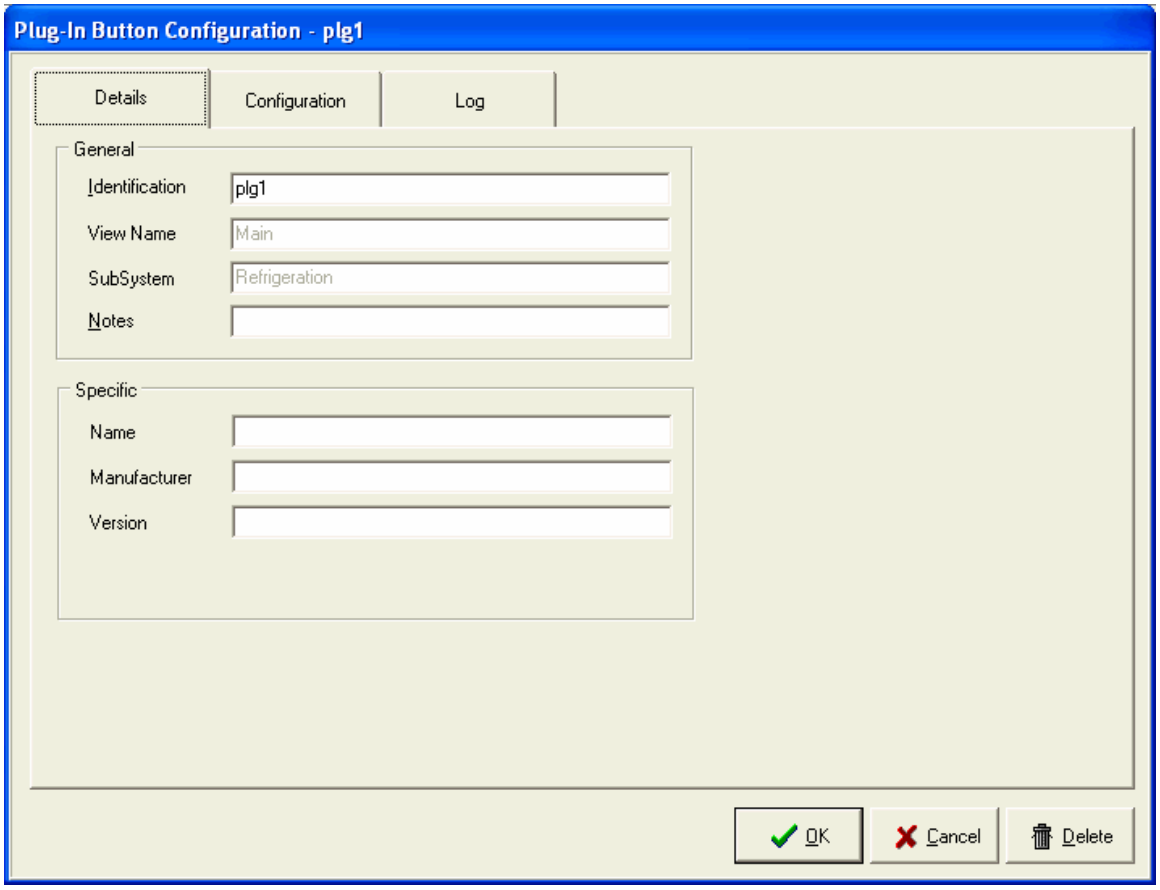
The first thing to do is to select the plug-in type. You have two choices. It can either be a MT Plug-In (Micro Thermo) or LNS Plug-In (LonWorks Network Services). Micro Thermo Plug-In are integrated code in the MT Alliance. When you are using LNS Plug-In it means that you are using a Plug-In that uses external code. The next thing to do is the plug-in scope. You will have the choice between: Site, Subsystem, Device Model or LonMark Object. A plug-in can manage all nodes on the site (Site), all nodes of a given subsystem (Subsystem), a single node (Device Model) or a single object inside a node (LonMark Object).

You will only be presented with nodes in the current subsystem that support this plug-in. If you do not see the node you are looking for, you have dropped the node or the plug-in in the wrong subsystem.

Once you have selected the proper node, if the scope is a LonMark Object, you have to select the proper object within the node. Otherwise, select the manufacturer among the available manufacturers and finally the plug-in name and version. Most of these choices will be filled automatically when there is only one available choice. The plug-in name describes what the plug-in can do.

As usual, select in which mode the plug-in will be visible to the end users. The default plug-in picture is that of an electrical outlet. Click on the 'Change picture' button to select a more appropriate picture. The 'Run Plug-In' button allows you to start the actual plug-in while in configuration mode. In Overview or Maintenance mode, the plug-in button opens the plug-in directly.

Don't forget to give the plug-in a useful identification in the "Details" tab…



2.31 Using a Plug-In

Each plug-in is dedicated to configuring, maintaining and monitoring a specific process (e.g.: a rooftop unit). So the user interface can be very different from one plug-in to another. Refer to the documentation of a particular plug-in if you need more information.

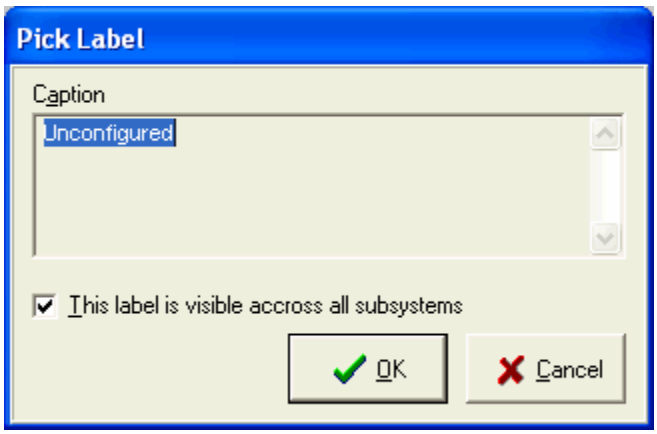
2.32 Dropping a Label

A label is textual information that you can add above the bitmap of a view but below every other component. You can use labels to add meaningful information on the views.

Labels can be dropped on a global view so that they are visible across all subsystems. Or they can be dropped on a global view but be visible only in one subsystem. Labels dropped on local views always belong to the same subsystem as the local view. Labels that belong to a particular subsystem can also be made visible or invisible according to the subsystem mode of operation. A label can be visible in all modes, in maintenance and configuration mode only or in configuration mode only.

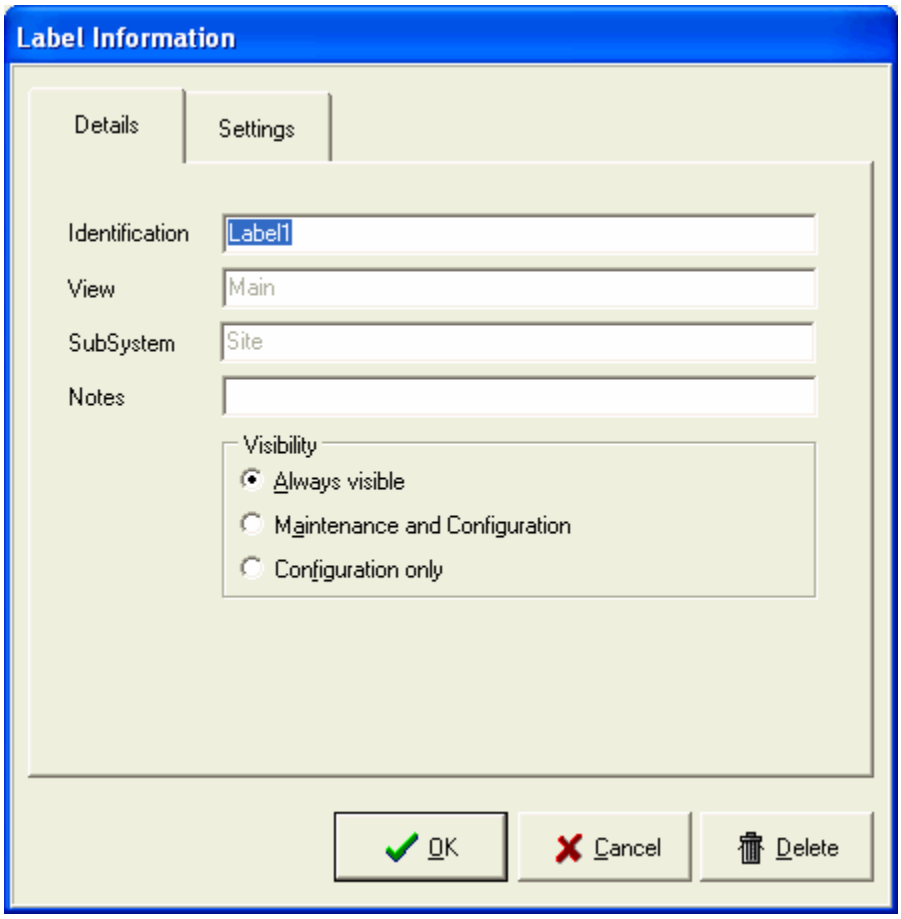
So you can use additional labels that are shown only to the maintenance personnel or to the configuration personnel.

Labels also have a third visibility feature. A label can be visible only when the view is not zoomed, only when the view is zoomed or in both cases.



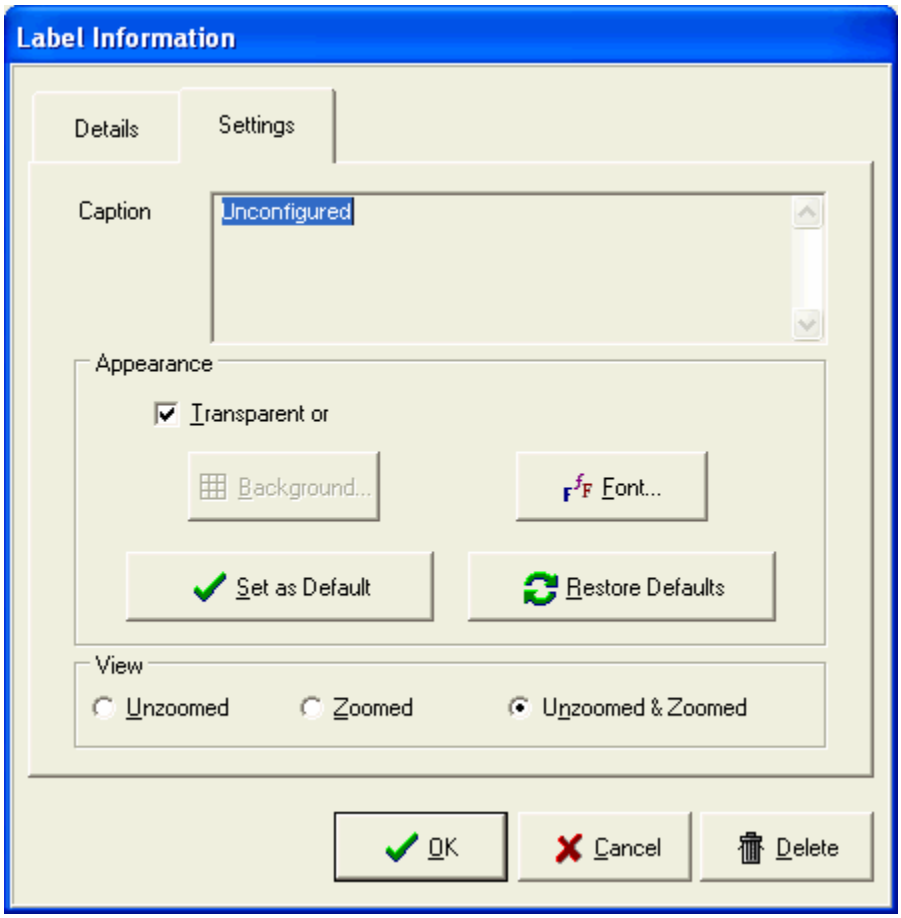
If you are dropping the label on a global view, you can specify if the label will be visible across all subsystems or not. You can also type in the caption text immediately.

2.33 Configuring a Label



You cannot change the label identification since it is automatically generated. Once you have dropped a label on a view, you cannot move it to another view. You can attach a note to this label. The note can only be seen by technicians who enter in configuration mode and click on the label.

Then you have to select the label visibility according to the subsystem mode.



In the 'Settings' tab, you can change the label caption. The label caption may be multi-line. Press the enter key to move on to the next line. You can use the multi-line feature to type vertical text (V-enter-E-enter-R-enter-T.....).

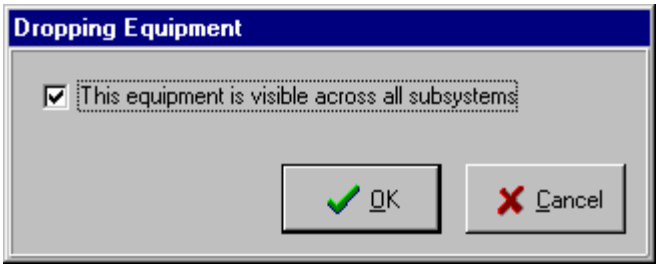
You can change the text font, size and its color. Labels have a transparent background by default. It is not ergonomically recommended to start putting label with background colors and text colors everywhere. If you want this feature activated, uncheck the "Transparent or" check box.

Once you have selected a text font, you can click on the 'Set as Default' button. Every other label that you drop will use the same text font, size and color unless you change it. If you like a font and size of a particular label and if you want to apply the same settings to another label, click on 'Set as Default' on the label you like and then click on 'Restore Defaults' on the label you want to change.

This is also where you can specify if the label is going to be visible in both the zoomed and unzoomed view or only in one or the other.

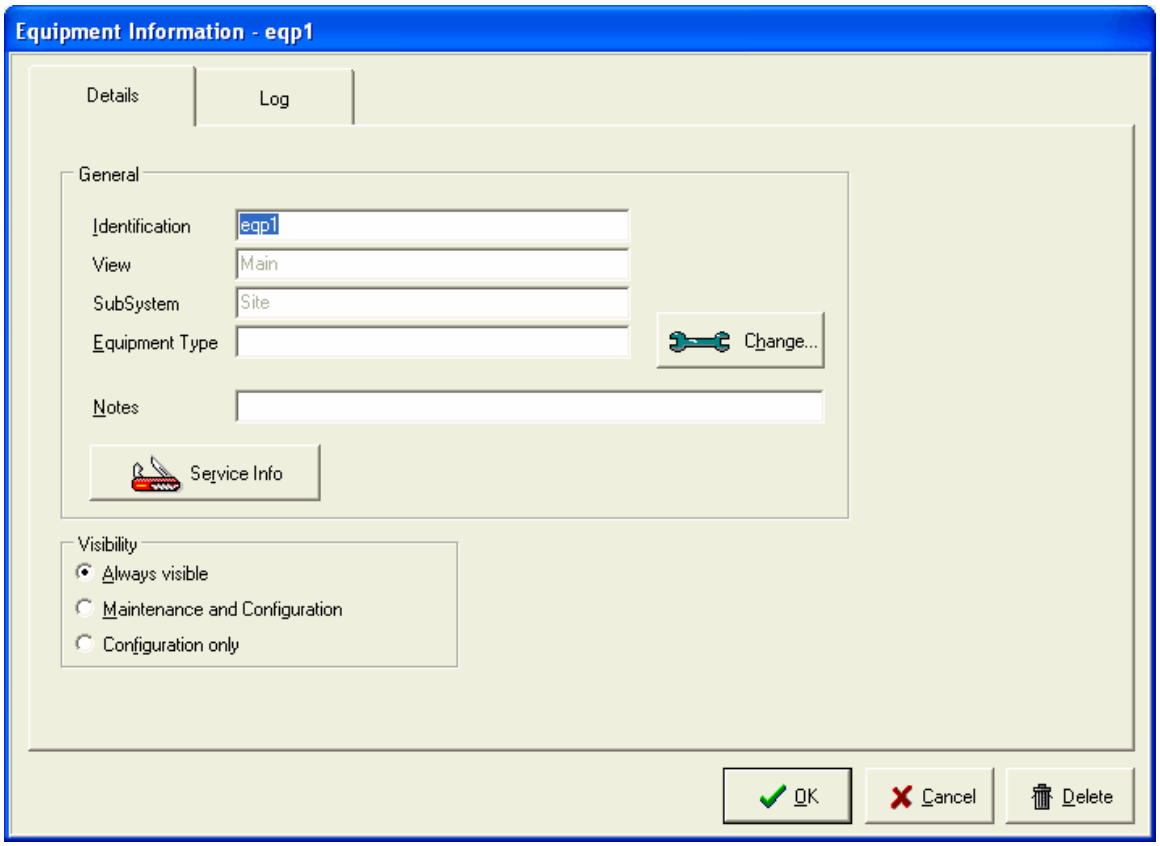
2.34 Dropping Equipment

An equipment is a button you can drop to represent equipment on the site. This is useful to show where the computers are installed, where the channel terminators were installed, you can even use it to show where the power outlets are. When dropping a equipment on a global view, the following window will come up:

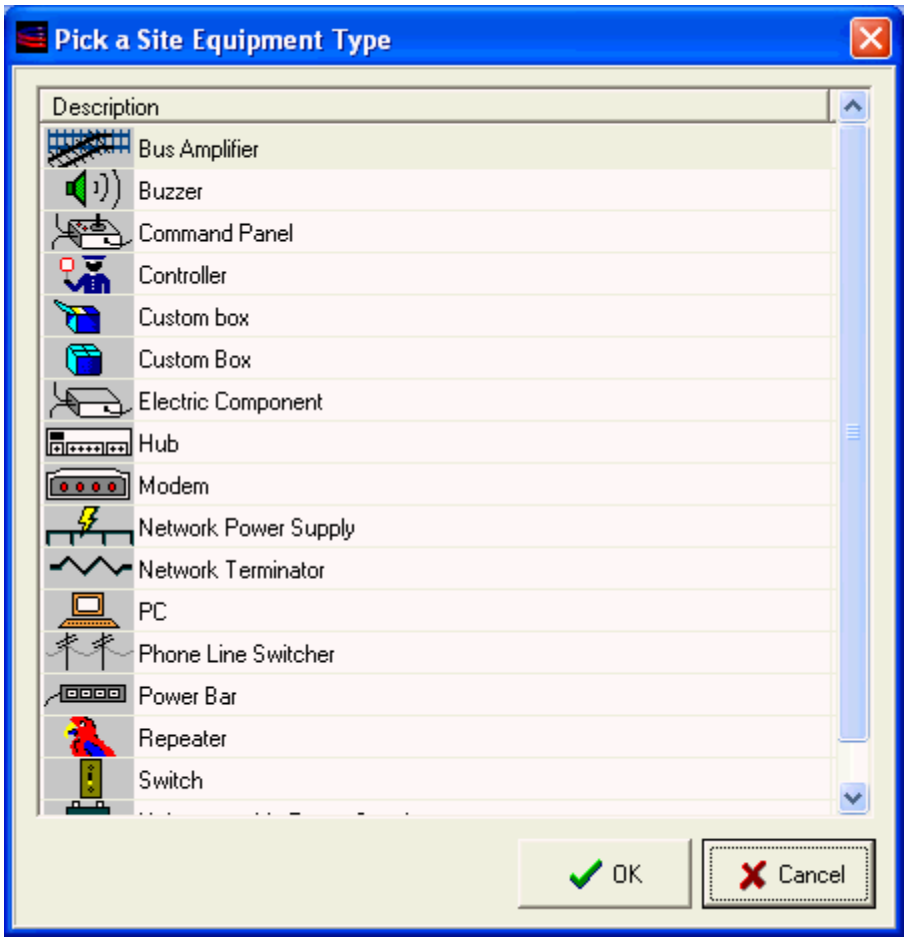


If you want the equipment to be visible across all subsystems then make sure to select the checkbox. If you want the equipment to be visible only in the current subsystem, do not select this checkbox.

2.35 Configuring Equipment



Every thing here should be familiar to you by now. The 'Change' button allows you to select a new picture for the equipment and a new description of the equipment type (which you can later change). For example, if this is global equipment you will get something like this:



You can add pre-defined equipment too but not from here. Note that no global reports are available for equipment and therefore the usefulness of this component is fairly limited.

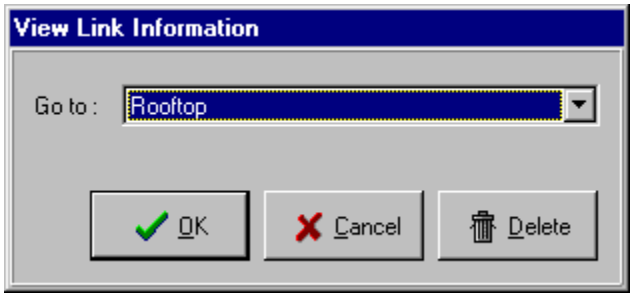
2.36 Dropping View Links

View links are provided as a way to geo-reference another view. For example, you might have the main floor plan, a mezzanine view and 2 rooftop views. Well where are those rooftops anyway? One way to show where the rooftops are is by dropping a equipment. If the rooftop is represented by a view, then on the main floor or on the mezzanine you can also drop a view link.

The View Link button will appear and by default it will link to the current view (although it obviously makes no sense to do that).

2.37 Configuring a View Link

Now click on the button that represents the view link, the following window will come up:



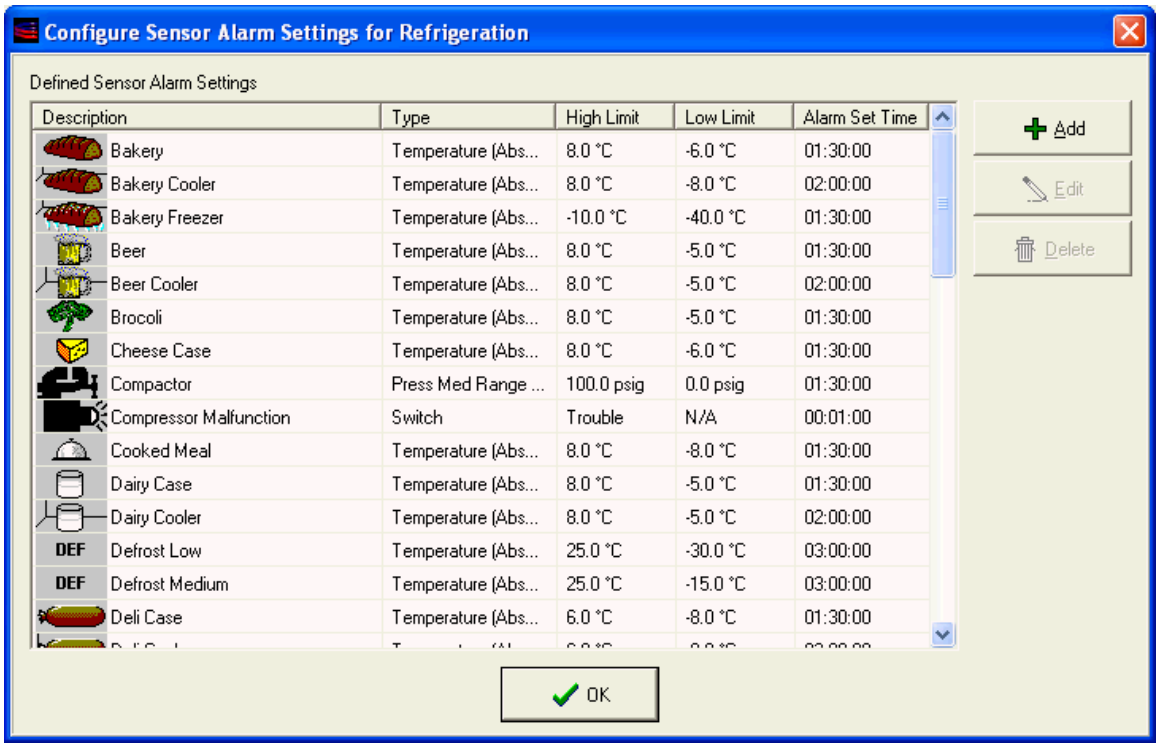
Now select another view to go to when the view link is pressed in overview or maintenance mode. Notice that in configuration mode, clicking on a view link does not make you go to the desired view, it brings up the 'View Link Information' window above.

If you drop a view link on a global view, you will be presented with a choice to go to any other global view or any local view in the current subsystem. So if you cannot select the view you want, first activate the proper subsystem, go in configuration mode and then configure the view link.

If you drop a view link on a local view, the view link will automatically belong to the current subsystem. You will be able to select any other local view or any global view but you will never be able to select a view in another subsystem.

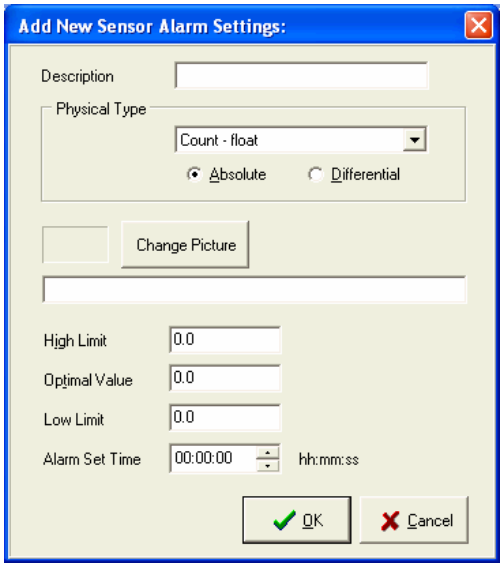
If you no longer want the view link, click on the 'delete' button.

2.38 Defining Sensor Alarm Settings



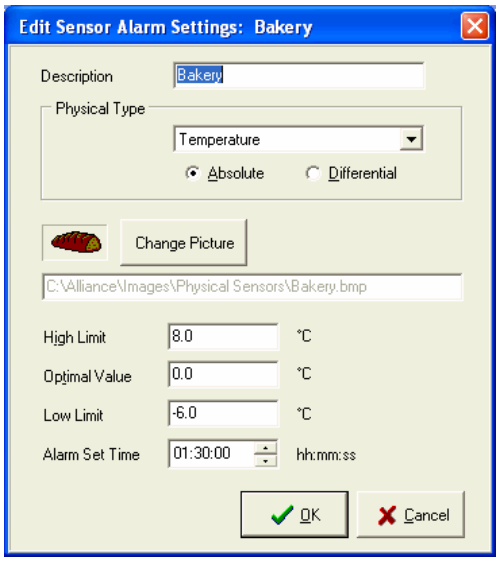
Under the menu "Configure", you will find the sub-menu "Sensor Alarm Settings…". This option allows you to add, edit or delete any alarm settings you might use when configuring an alarm sensor.

To add a new sensor alarm settings just click on the "Add" button to bring up the following window.



All fields are mandatory. You need to fill every field in the list to create a new sensor alarm setting. Once, you are done click the "Ok" button to save your change or click on "Cancel" to delete your modification. Note, that you have the option to add a picture to define your new sensor alarm setting.

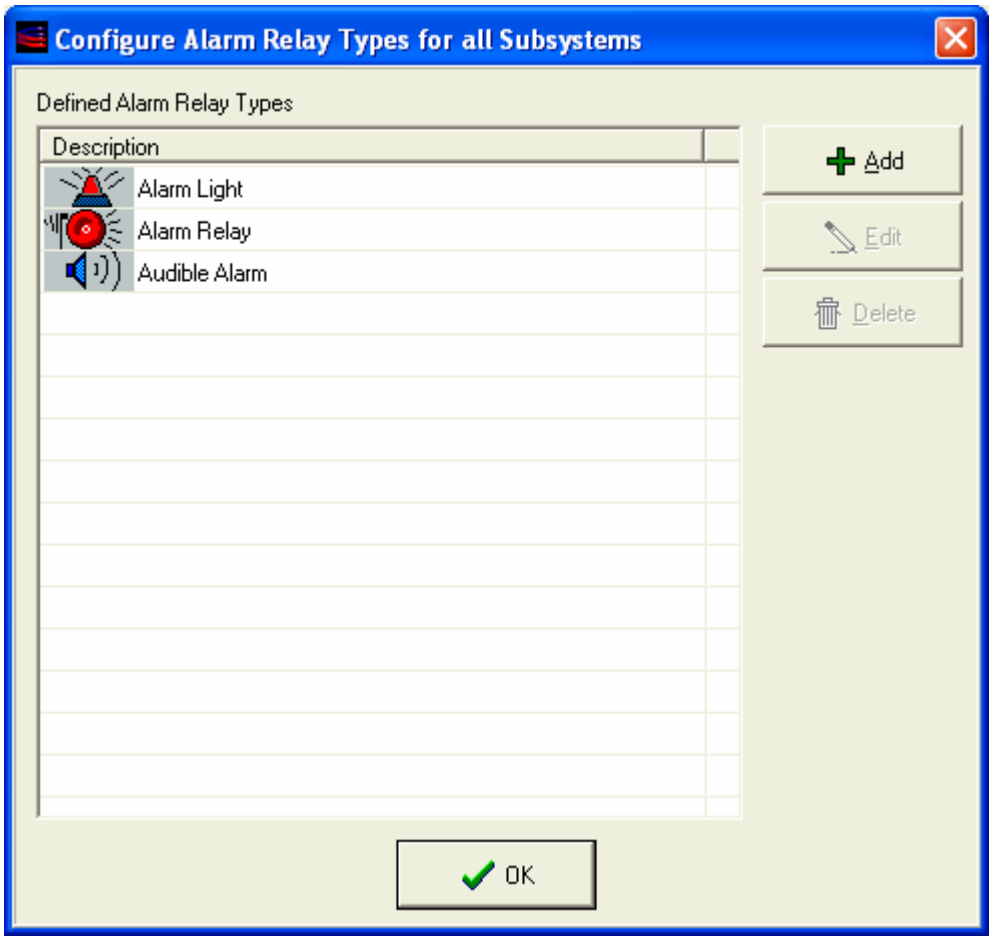
To edit an existing sensor alarm setting, pick one of the define sensor alarm setting in the list and click on the "Edit" button. The following window will came up.



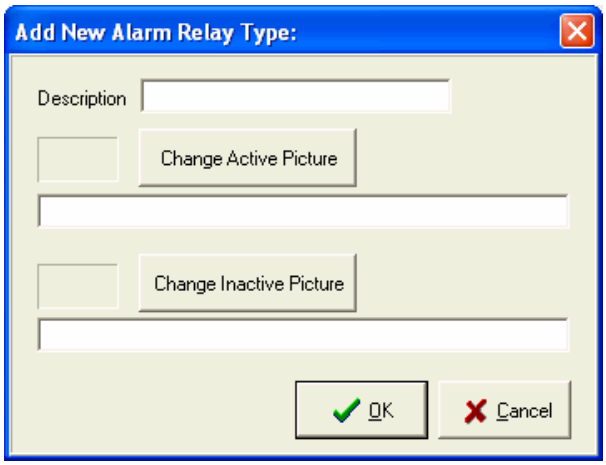
Every field can be modify, as well as the picture that defined the sensor alarm setting. Once you are done, just click on the "Ok" button to save your modification or click on the "Cancel" button at anytime to cancel your modification.

To delete an existing sensor alarm setting, just pick the desired sensor alarm setting and click on him to select it. Then click on the "Delete" button to delete this setting. You will be prompt to check if you really want to delete this setting before you can do so.

2.39 Defining Alarm Relay Types

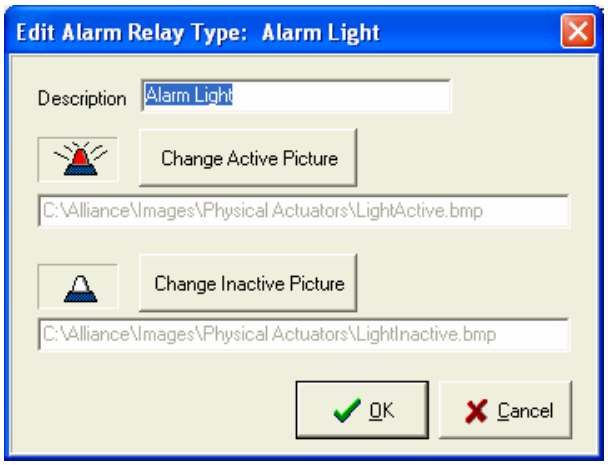


When dropping an alarm relay in your main view, you need to specify his type. The Defining Alarm Relay Types tool let you add, edit or delete any alarm relay types. This tool can be found under the menu "Configure" and sub-menu "Alarm Relay Types Settings…".



When clicking on the "Add" button, you will get previous window. You need to specify the name of the new Alarm Relay type in the description field and pick to picture to define Active and Inactive Alarm Relay type.

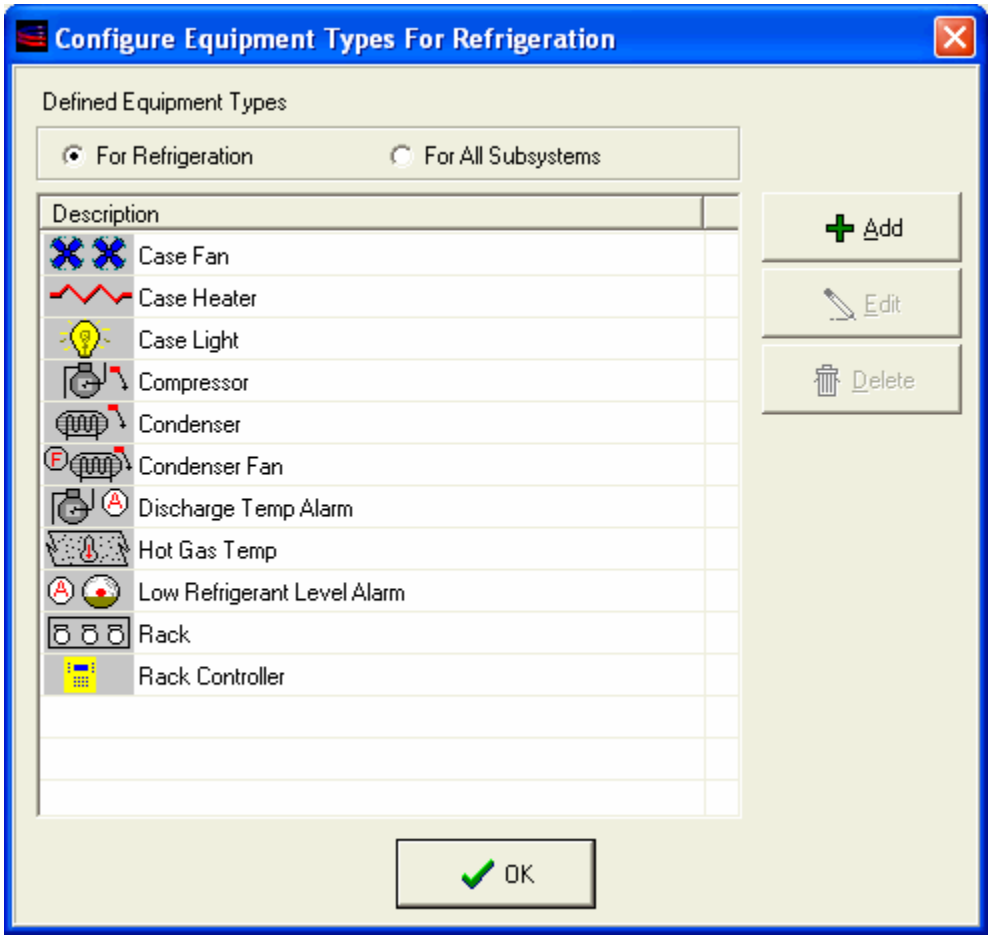
To edit an existing Alarm Relay Types, pick one of the define Alarm Relay Types in the list and click on the "Edit" button. The following window will came up.



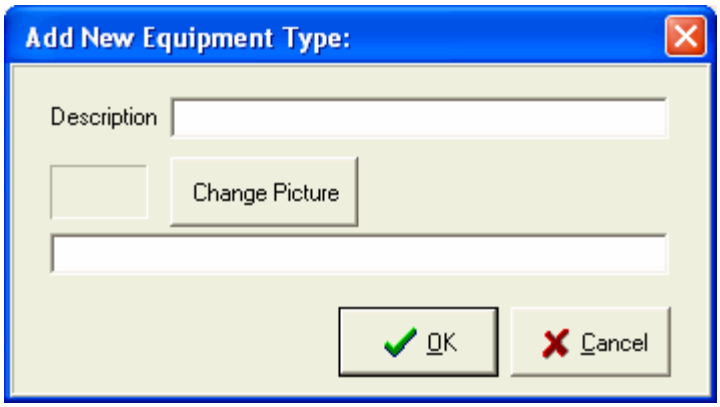
Every field can be modify, as well as the picture that defined the Alarm Relay Type. Once you are done, just click on the "Ok" button to save your modification or click on the "Cancel" button at anytime to cancel your modification.

To delete an existing Alarm Relay Type, just pick the desired Alarm Relay Type and click on him to select it. Then click on the "Delete" button to delete this type. You will be prompt to check if you really want to delete this type before you can do so.

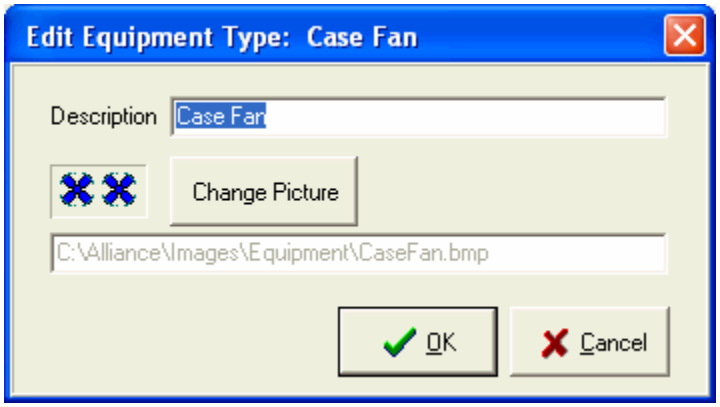
2.40 Defining Equipment Types



Any equipment you may drop in any views need to be defined. In order to do so, you need to access the tool via the menu "Configure" under the sub-menu "Equipment Types…". Equipment Type can either be for Refrigeration only or for All Subsystems. Just select the right radio button to go from one list to the other.

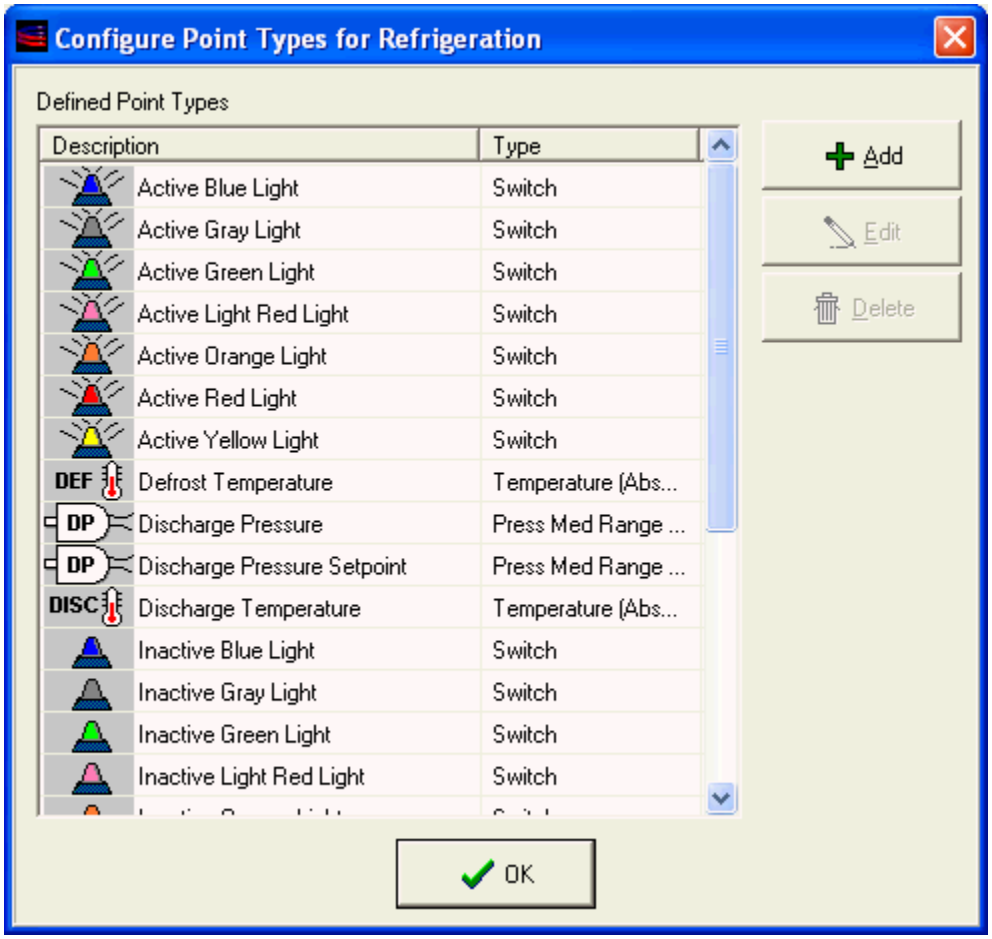


When adding a new equipment types you need to specify the description of this equipment and provide a picture. You can access this window simply by clicking on the "Add" button on the Configure Equipment Type main window.

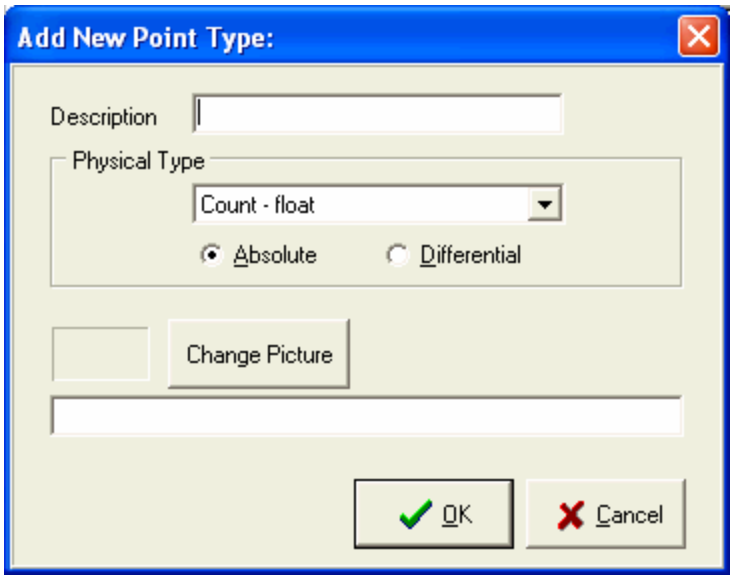


In order to edit any equipment type, select from the main Equipment Type window the equipment type you wish to edit and click the "Edit" button. The previous windows will come up an allow you to update either the description or the picture of that Equipment Type. Once you are done and satisfy with your change simply click the "Ok" button to save it. Otherwise click on the "Cancel" button to reject any change you have made.

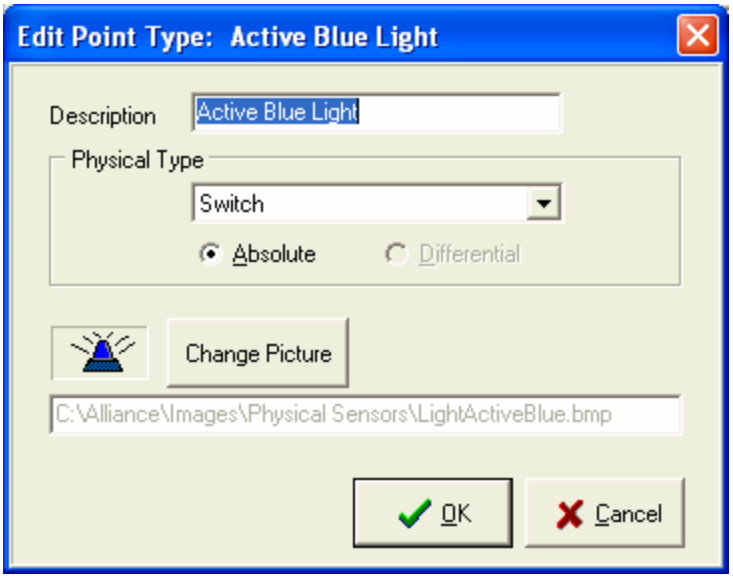
2.41 Defining Point Types



Any custom point that you added to any views or subsystems can be identify by a defined Point Types. This tool allows you to add, edit or delete any Point Types defined in our database. The tool to Configure Point Types can be found under the menu "Configure" under the submenu "Point types …".

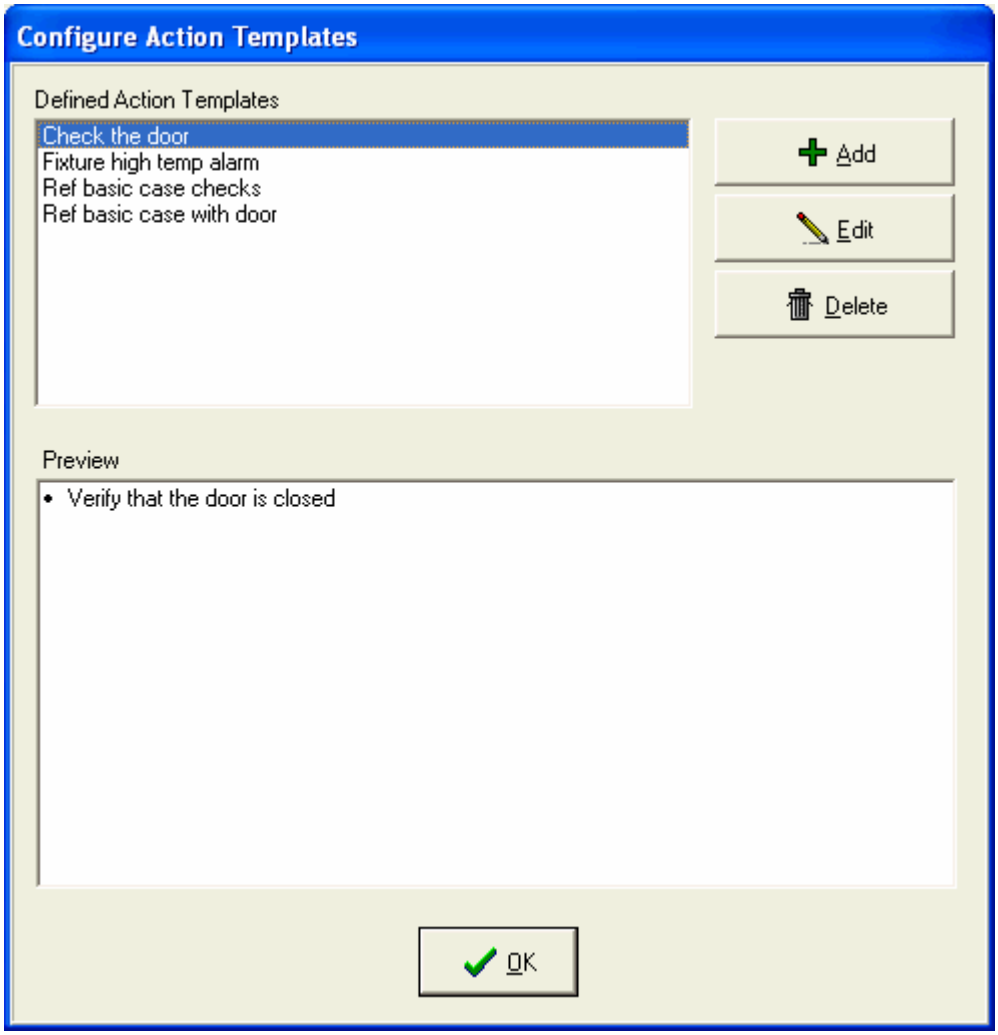


To add a Point Types to the existing list, just click on the "Add" button and the previous window will come up on your screen. Give to your new Point Types a description, a physical type and linked it to the appropriate picture. Once you are done, simply click on the "Ok" button to save your new Point Type. Otherwise, click on the "Cancel" button to erase your new entry.



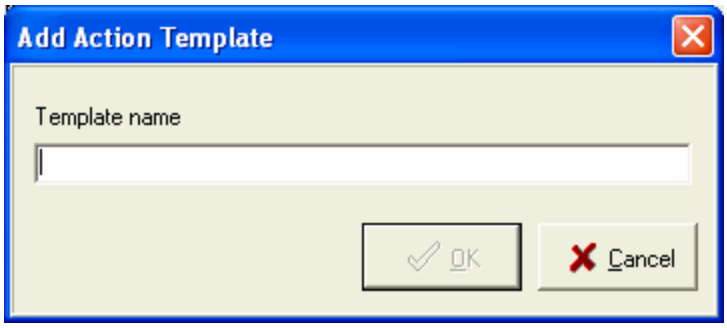
To update or edit any existing Point Type, click on the "Edit" button and the previous window should appear on your screen. Any fields can be modify with your new settings. Once you are done and satisfy with your entire modification click on the "Ok" button to save it. Otherwise click on the "Cancel" button to reject any changes you have made.

2.42 Defining Action Templates

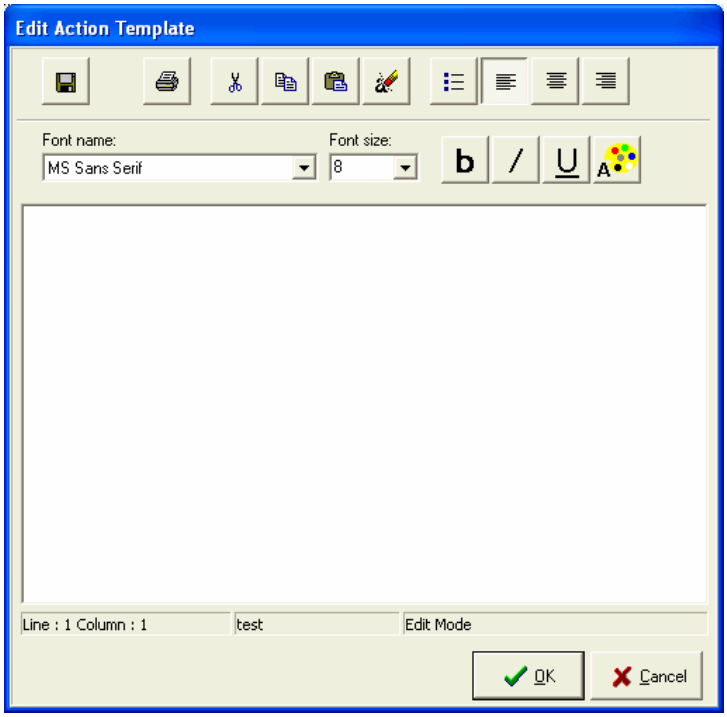


Once you click on the acknowledge button for an active alarm on a sensor, you get a list of actions that you can do before calling your support company for help. These actions are kept in the Action Templates tool. When dropping a new sensor and configuring his alarm settings you have the option to add defined Action Templates in case an alarm is generated on this sensor.

The current tool allows you to add, edit or delete existing Action Templates from the list. It can be found under the "Configure" menu and submenu "Action Templates…".



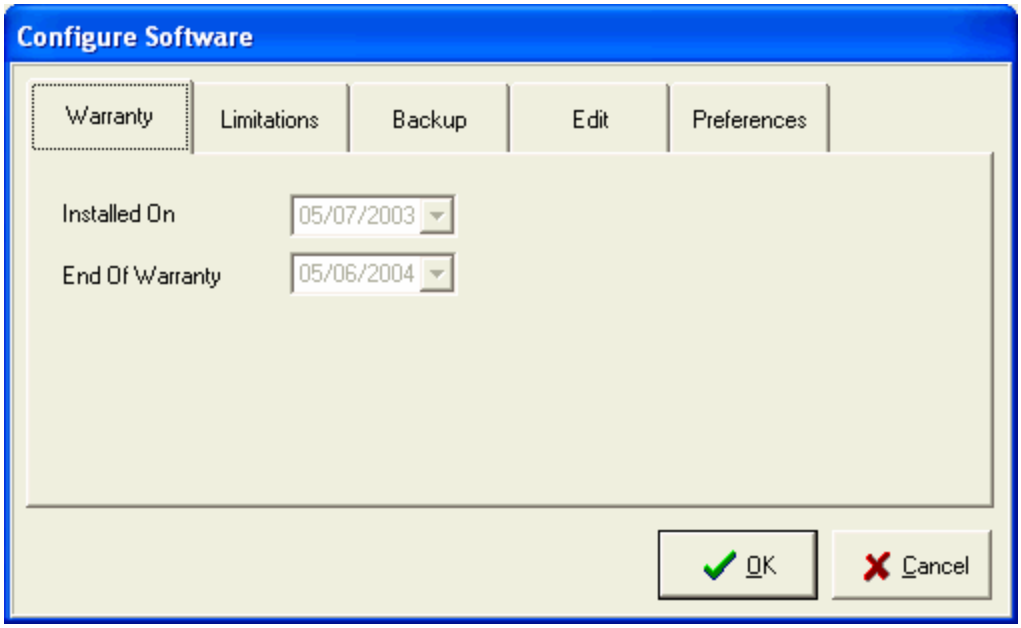
When clicking on the "Add" button the previous window come up on your screen. The first step is to specify a name to your new Action Template. Once you are done and you have click on the "Ok" button, the following window appears. You then need to write a list of all actions needed to be taken before the manager calls his support company.



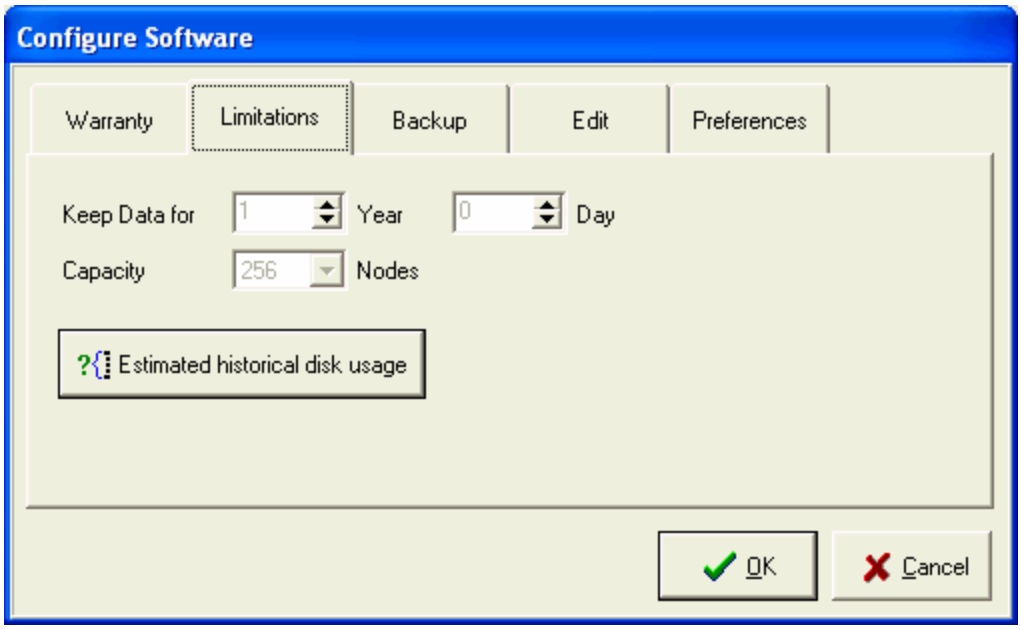
When clicking the "Edit" button, the same windows as this one will come up on your screen. The only difference is that the existing Action Templates will appear in the text box of the window. You just need to modify and save your changes in order to edit the existing Action Templates.

2.43 Configuring the Software

Log in as a super technician using today's access code. Call the Technical Support Company' to get the access code if you do not have it. From the menu select 'Configure' and then 'Software'. The following window will come up:



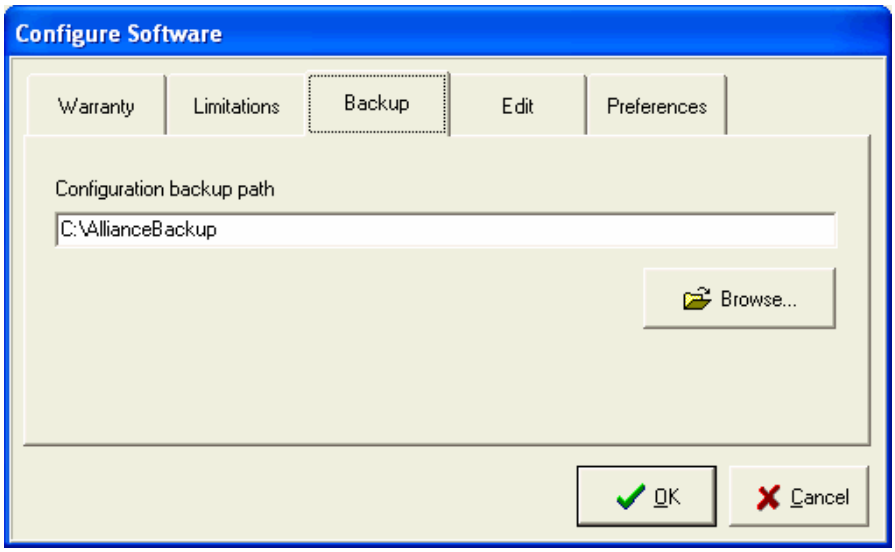
Select the date of installation and the date of the end of the warranty. Usually the warranty ends one year after the installation date.



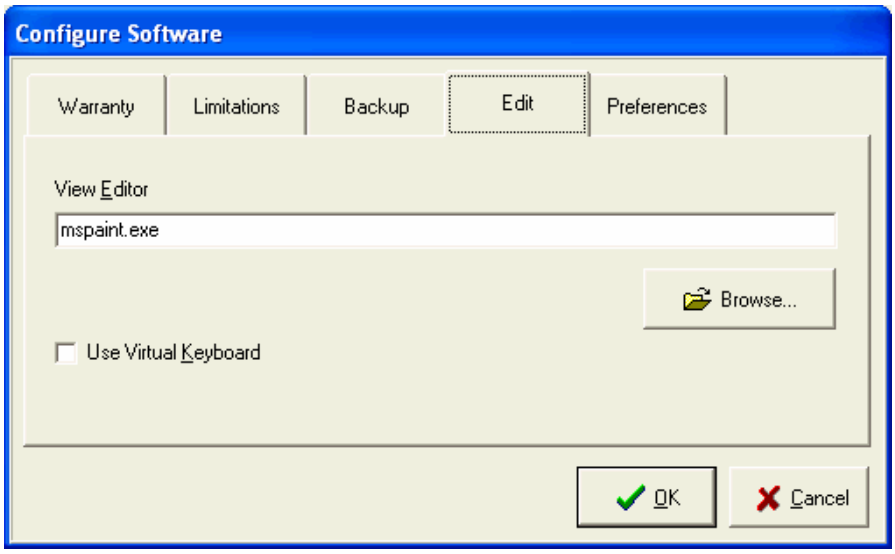
Here you can set the period for which the Alliance will keep historical data. One year is a good default value. The longest period you can select is three years. The Alliance historical data is self-cleaning. Anything older than the specified period is automatically erased. The estimated historical disk usage button is there to help you figure out if you will have enough disk space for the period you select.

You should know that this is a rough estimate and that it will work only once the site is fully installed and the Alliance has run a full day. On the next day, clicking on the button will extrapolate and guess the approximate disk space requirements. If you do not have enough estimated disk space, reduce the period of historical data conservation.

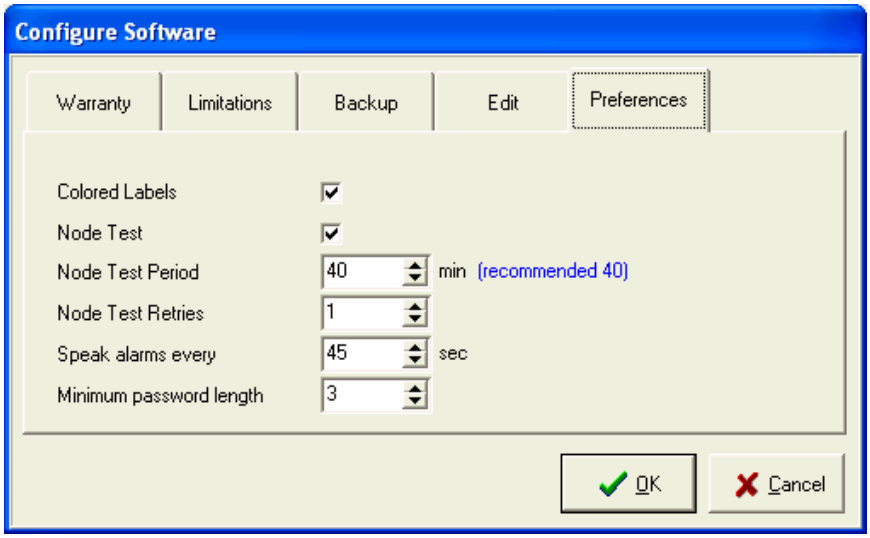
The capacity allows you to select how many nodes you can install on this site. If that number is not sufficient and you want to increase it, you will have to contact Micro Thermo Technical Support. New files will then be shipped on the site to increase the capacity. Micro Thermo has to pay Echelon royalties for the number of nodes that you are allowed to install and must send periodic royalty reports to Echelon.



Select a path where you want the backups to be created. Each backup contains the entire site configuration including the LNS database. Backups are huge compressed files. Each time you create a backup it is given a name such as Alliance_Version3_SP2_2001-08-10_10-45-33.zip. You can create backups on another drive, on another PC or on a set of diskettes.



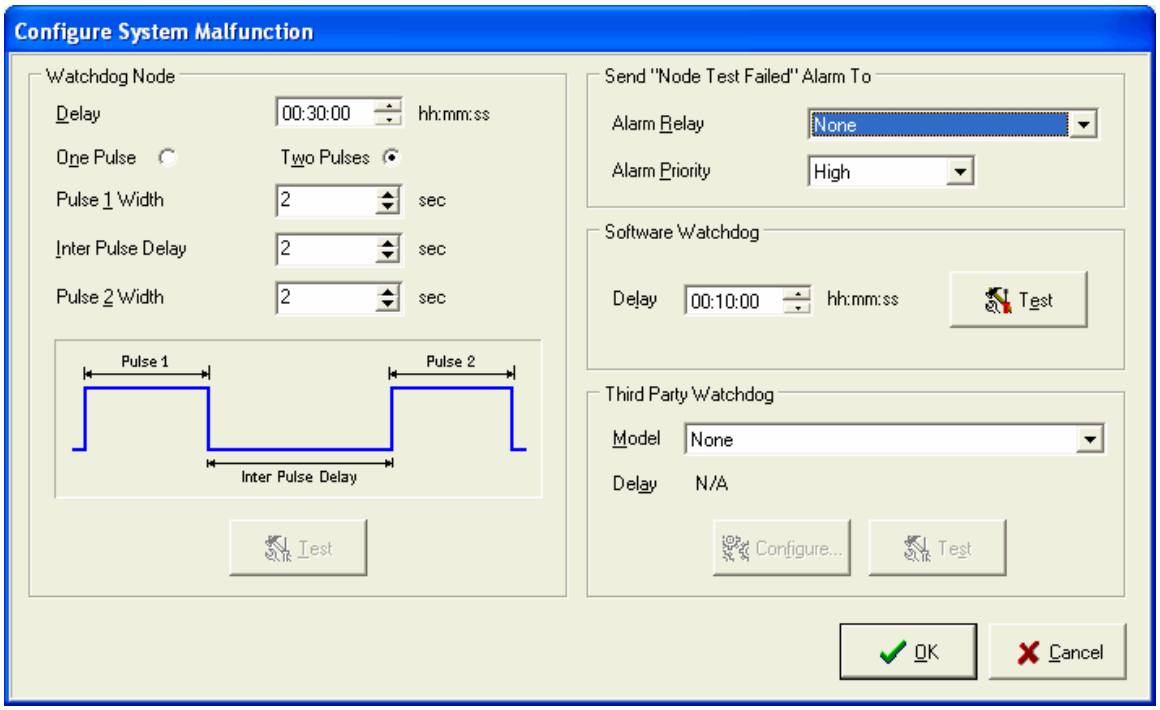
You can select which tool will come up to edit the view bitmaps. Usually this is Microsoft Paint because it is included with Windows and requires little training. If you have a touch screen and want to hide or remove the keyboard, select 'Use Virtual Keyboard'. An alphanumeric or numeric keyboard will come up every time you click in a field. Be aware that not all features are available with the virtual keyboard. For example, you cannot move a component after dropping it.



Select all preferences linked to all subsystems. These preferences are security, performance and reliability parameters.

2.44 Configuring System Malfunction Parameters

Log in as a super technician using today's access code. From the menu select 'Configure' and then 'System Malfunction'. The following window will come up:



You can select one global alarm relay that will be activated whenever a node test fails on the site. Node tests are performed regularly by the Alliance. When the Alliance is not up and running, this feature doesn't work. Upon detection that a node is not responding, the Alliance will send an alarm to the alarm controller node. So if the failure is due to a short circuit or open circuit on the data cable between nodes, this feature may not work. This feature will not work if the node that has failed is the alarm controller node where the actuator is located.

The Hardware Watchdog Delay is a feature that all Alarm Controller Nodes and all Internal Watchdog Nodes (older generation) have. The Alliance periodically talks to all alarm controller nodes (and internal watchdog node). If after the period specified above, an Alarm Controller Node has not received anything from the PC; it will activate its fifth relay (or the reset relay for the internal watchdog node). If connected on the PC reset line (or power line), then the PC will be rebooted just as if it had lost power for a second.

The Software Watchdog is another Windows application that sits in the system tray (the little dog icon). The principle of operation is identical. The Alliance periodically talks to the Software Watchdog. If for any reason the Alliance fails, the Software Watchdog will reboot the PC. This feature will not work it Windows itself has frozen or failed. A Software Watchdog delay of 10 to 15 minutes is a good choice. The Hardware Watchdog Delay should be from 30 to 45 minutes.

2.45 Adding User-Defined Subsystems

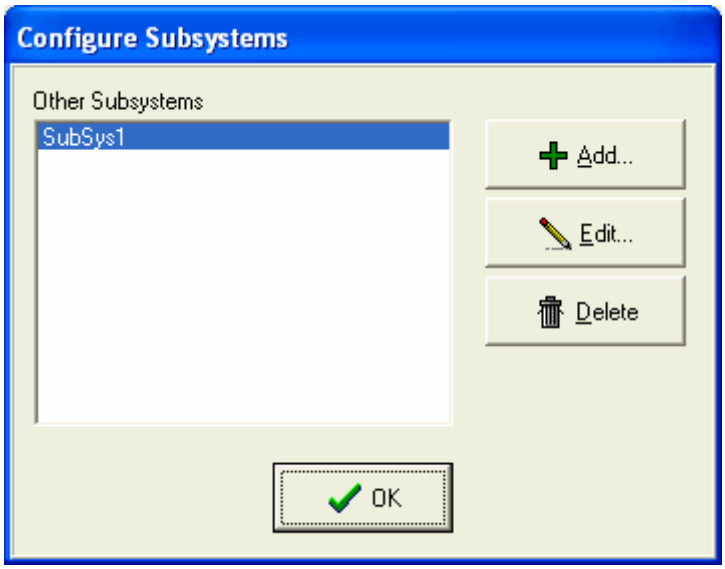
On top of the pre-defined subsystems (Refrigeration, HVAC, Lighting and Energy), you can define up to three other subsystems. Pre-defined subsystems give access to specialized functions such as the 'Refrigeration Configuration Tool', the HVAC plug-ins, the HVAC and Lighting Schedules, etc.

User-defined subsystems do not have any specialized functions. Still they can be used to drop sensor nodes, sensors, equipment, labels, custom nodes and custom points, LNS plug-ins, alarm relay and alarm controller nodes.

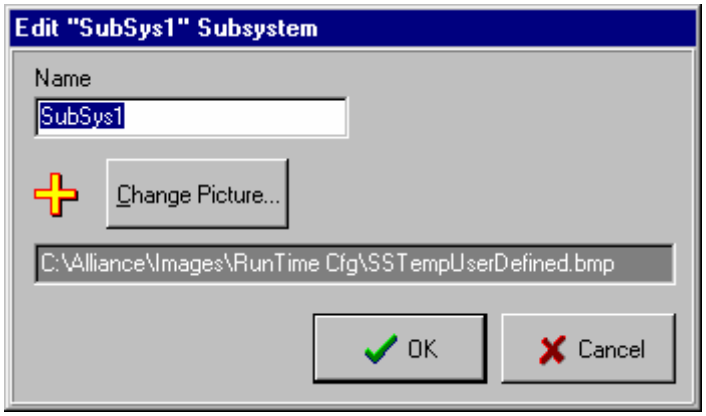
For example you can define an 'Electrical' subsystem and drop equipment everywhere there is an electrical outlet in the site. Or you could create a 'Water Distribution' subsystem and show the position and state or the valves.

The most common use of user-defined subsystems is to fake a pre-defined subsystem. For example, if on a site we do not control the racks but we want refrigeration alarms, you can create a user-defined subsystem and name it: 'Refrig'. You are not allowed to use exactly the same name as a pre-defined subsystem.

If user-defined subsystems have been activated on your site, then you can manage user-defined subsystems. Go to the menu and select 'Configure' and then 'Subsystems'. The following window comes up:



There is always at least one user-defined subsystem if the feature has been activated. Click on the 'Edit' button. The following window will come up:



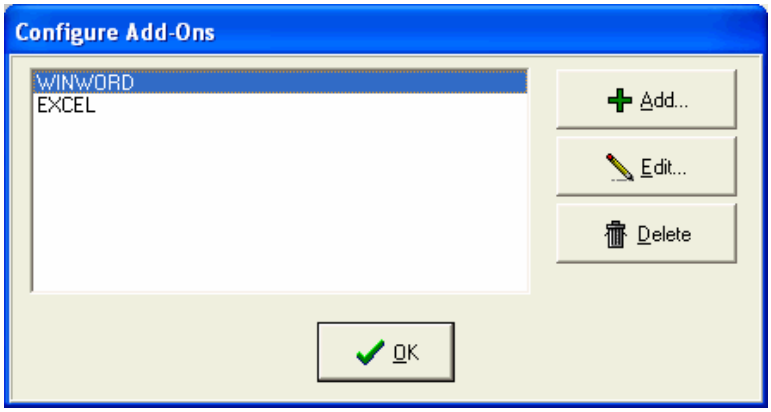
You can change the subsystem name to say 'Electrical' and you can also change the default picture on the toolbar. The best thing to do is to copy one of the existing SSNameOfTheSubSystem.bmp images in the c:\Alliance\Images\RunTime Cfg directory.

Once you are done, close this window. To add a subsystem, simply click on the 'Add' button. A similar window will come up. Note that you cannot delete a subsystem if components have been dropped in that subsystem. All components must be deleted first and then the subsystem can be deleted.

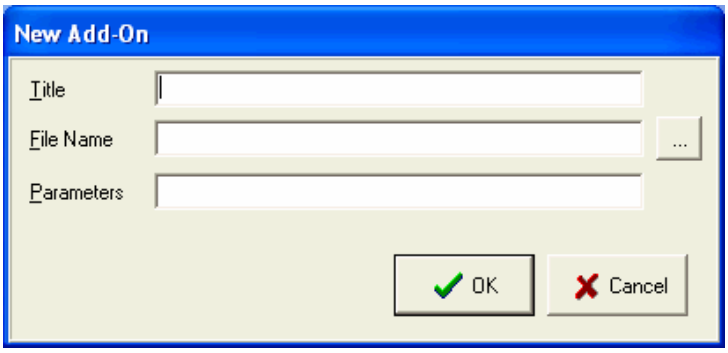
2.46 Configuring Add-Ons

Add-ons are links to other applications that can be invoked from the MT Alliance toolbar without minimizing the MT Alliance. An add-on can start an application such as Microsoft Word or a document that in turn opens up the associated application.

On the menu, click on 'Configure' and then 'Add-Ons'. The following window will come up:



Click on the "Add" button and the following window will come up:

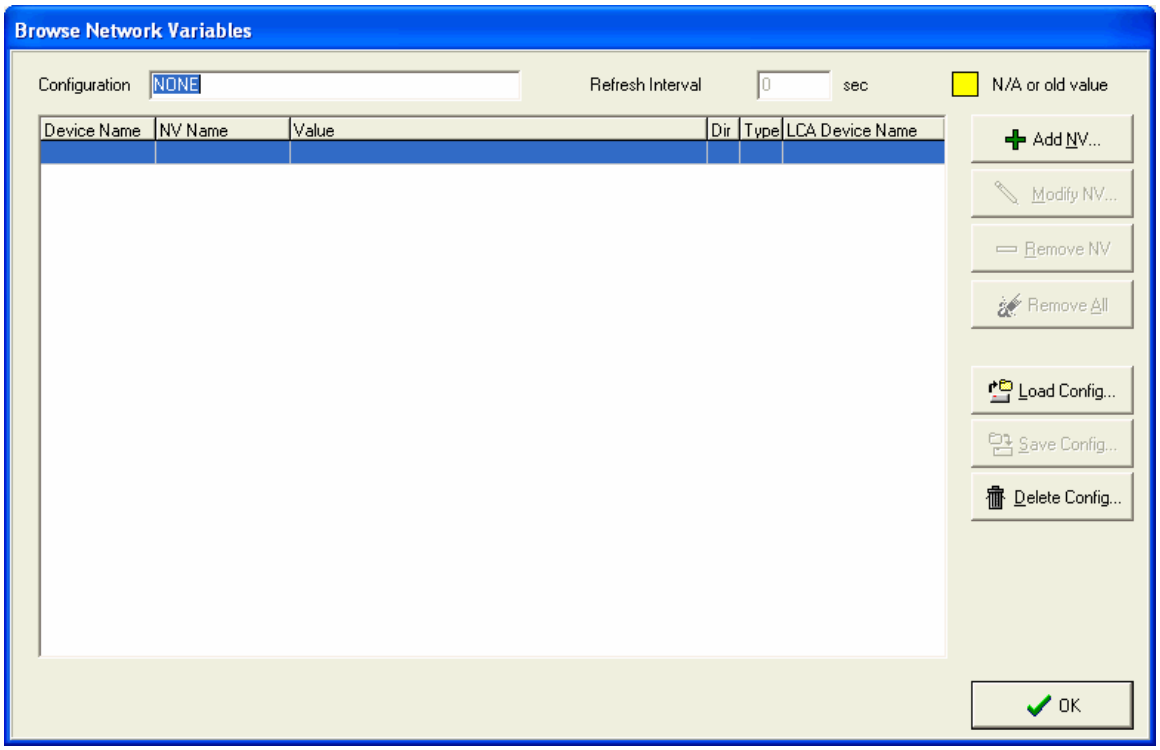


For example, to configure a new add-on to start the System Log, click on the '…' button and select c:\Alliance\SystemLog.exe. The title will automatically be set to SystemLog. Click OK, save your modifications and click OK again. The SystemLog icon will now appear in the MT Alliance title bar.

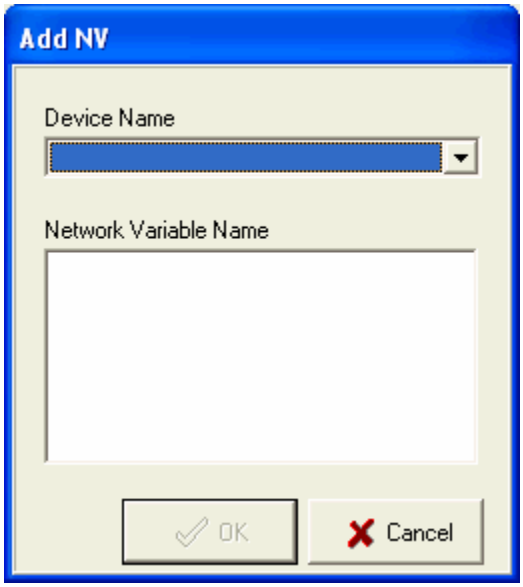
If an executable accepts command line parameters, you can put these in too. Note that the file name you choose does not have to be an executable. If you select a Microsoft word document and if Microsoft Word is installed on the PC, then Word will be started and will open the document you have selected.

2.47 Browsing Network Variables

From the MT Alliance menu, select 'Network' and then 'Browse Network Variables'. The following window will come up:



To see the current value input network variables or output network variables on any node, click on the "Add NV" button.



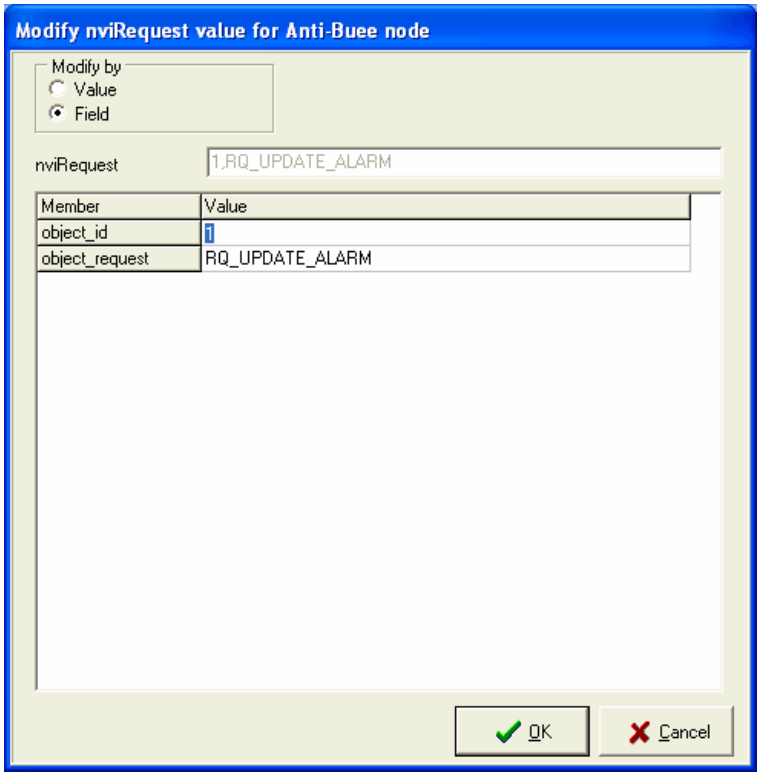
Select a device name (or node identification). All available networks variables on this node will appear below. Select one or more variable you want to look at and click on the 'OK' button.

You can repeat this as many times as you need if you want to see variables from other nodes as well. The 'Browse Network Variables' window is now filled with your selection and a value is displayed besides each variable.

If for some reason a node being monitored is not responding (no power or no data cable), then you will see N/A shown in yellow. If a variable has not been refreshed for a long period of time, it will also be painted in yellow to indicate that the value you are reading is stale. Under certain conditions, this is perfectly normal. Some network variable are connected to the PC and transmitted only when the node strategy dictates.

All output network variables will appear in white text over a dark gray background to indicate that you cannot edit this value (you cannot write on any nvo). If an input network variable is shown in dark gray, then it is controlled by the MT Alliance and you are not allowed to change it here. For example, there may be a command point on this nvi or a plug-in may be in control of this value.

If you want to change the value of an nvi, double-click on the line or click on the 'Modify NV' button. The following window will come up:



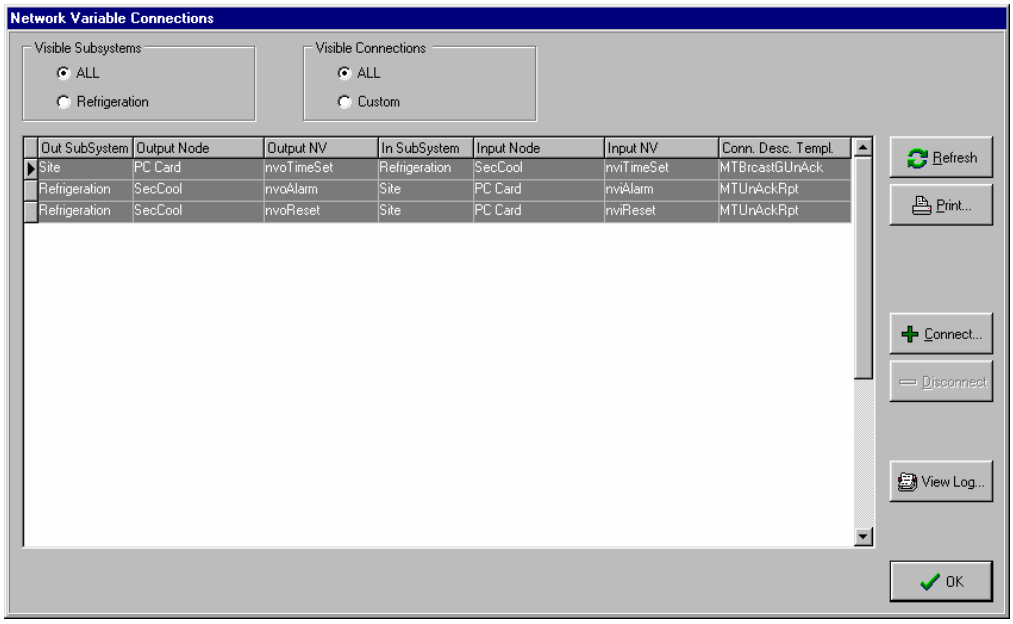
You can change the value of the variable. If you select 'Save value', this value will be re-transmitted to the node each time the node is reset or the software is loaded. It is exactly the same effect as putting a command point on that nvi without having any command point on the user interface. If you want to periodically send this value to the node (because it has a receive heartbeat feature), you can set the 'send heartbeat' value to something else than zero. Note that the send heartbeat value should be approximately 1/3 of the receive heartbeat value in the node. Also note that 'send heartbeat' values less than 1 minute are not recommended.

To remove a NV, click on the line you want to remove and then click on the 'remove NV' button. To remove all NVs, simply click on the 'Remove All' button. If you often come back to look at the same set of variables from different nodes, you can save the configuration and load it again later. Simply give a name to your configuration. Next time, click on the 'Load Config' button to restore your browser configuration.

Click on the 'Delete Config' button to get rid of configurations that you are no longer using.

2.48 Connecting Network Variables

If you need to see the network variables connections that have been made on this site, first select the subsystem you are interested in. Then from the Alliance menu, select 'Network' and then 'Network Connections', the following window will come up:



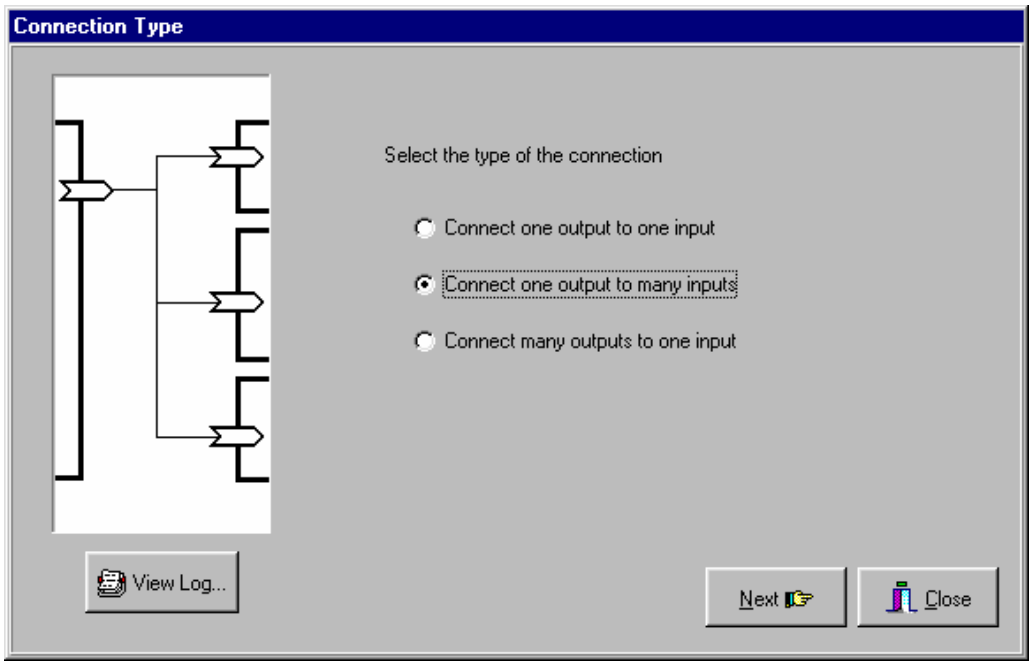
Initially the Window will be empty. You have to press the 'Refresh' button so that the list is refreshed. Note that since a site can contain thousands of network variable connections, the refresh process can take a few minutes. Once the list has been refreshed, you can rapidly filter its content. The 'Visible Subsystem' group allows you to see all connections of the site or only the connections of the current subsystem.

The 'Visible Connections' group allows you to see all the connections of the site or all the connections of a particular subsystem. This includes network variable connections that are automatically made by the MT Alliance Platform. Selecting 'Custom' will only show you the connections that were manually made by the installers.

If a connection is listed in dark gray, it is controlled by the Alliance and you cannot remove it. If a connection is listed in white, then you can remove it by clicking on the line first and then click on the 'Disconnect' button. Note that the list is 'refreshed automatically' every time you remove a connection and this takes a long time. If you want to remove many connections, it is better to select all the lines first (with the CTRL button pressed) and then click on the 'Disconnect' button.

The 'View Log' button allows you to see who made or removed what connections and when.

To create new custom connections (a custom connection is a connection that you make manually and that the Alliance does not handle automatically), click on the connect button. The connection wizard will come up :



When and why would you need to make custom connections yourself? If you drop custom nodes to perform specific applications along with custom points and you want these custom nodes to share information among themselves or among other nodes, then you need to make a custom connection. You may want to do a custom connection for things that are not (yet) automatically controlled by the MT Alliance. This includes: inter-rack connections, sharing a temperature sensor between multiple rooftops, using a sub cooler node or a high speed defrost node, etc.

The first step is to select the type of connection. The choices and the graph to the left are self-explanatory. Connecting one output to many inputs is also called a 'fan-out' connection. Connecting many outputs to one input is also called a 'fan-in' connection. Click the 'Next' button when you are done.

There are too many combinations possible to explain each one individually. That is why a Wizard is provided for this task. We will give a broad outline in the coming paragraphs.

The next thing is to select a node and an output variable (or in the case of a fan-in, an input variable). Then you can select the input network variable (or variables) on other node(s). In the case of a fan-in, you will select output network variables(s).

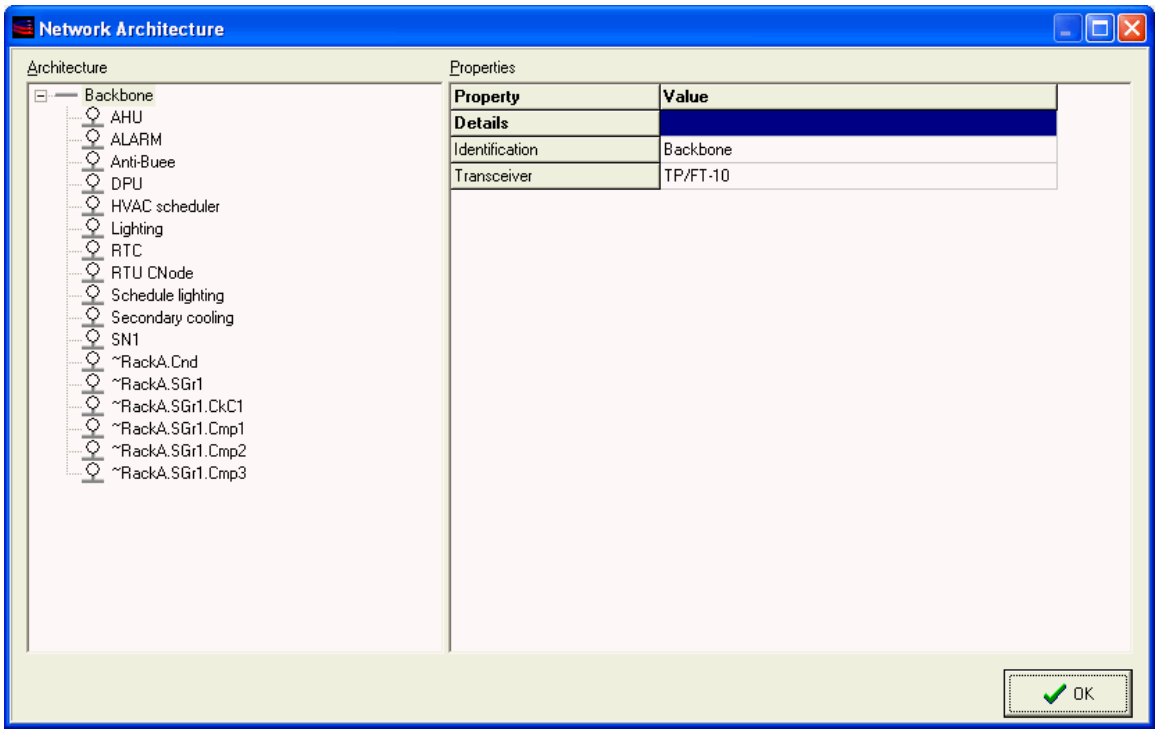
Finally the last thing to do is to select the type of connection (also known as a connection description template). There are two very important things about a connection. The first one is how the message will be sent. Unacknowledged (and unrepeated) service means that the message will be sent once. This is good for any network variable that is periodically sent out (like a temperature or a pressure). One lost message has no dramatic consequences in this case. If one message does not make it from node A to node B, it will make it the next time.

The repeated service means that the message will be transmitted 4 times very rapidly on the network. This is a good choice for things that are not transmitted periodically by a node such as an alarm or a switch change.

The acknowledged service means that node A will transmit to node B and wait for a confirmation from node B that the message has been received. This is the safest service that you can select. We do not recommend its usage on the MT Alliance platform.

Messages can be sent to each node individually or it can be broadcast to a group. Select the unacknowledged unrepeated group for sharing a temperature sensor between multiple rooftops. Select the repeated group service for sharing things like a switch.

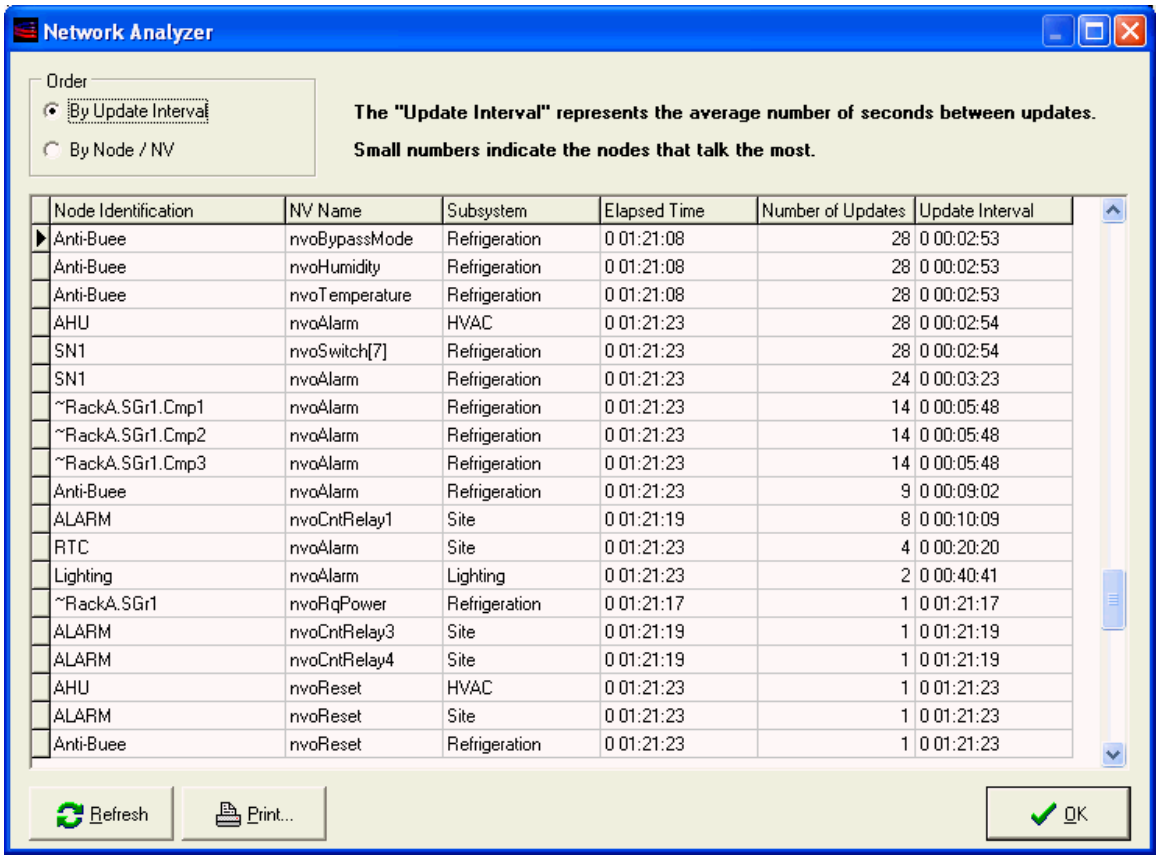
2.49 Viewing the Physical Network Architecture



From the Alliance menu, select "Network" and then "Network Architecture", the previous windows will come up.

This tool allows you to see all physical nodes installed on every part of your network. If you have one or more router on your network, you might want to know where nodes are installed on the network and on which channel they are.

2.50 Network Analyzer



Node Identification	NV Name	Subsystem	Elapsed Time	Number of Updates	Update Interval
Anti-Buee	nvoBypassMode	Refrigeration	0 01:21:08	28	0 00:02:53
Anti-Buee	nvoHumidity	Refrigeration	0 01:21:08	28	0 00:02:53
Anti-Buee	nvoTemperature	Refrigeration	0 01:21:08	28	0 00:02:53
AHU	nvoAlarm	HVAC	0 01:21:23	28	0 00:02:54
SN1	nvoSwitch[7]	Refrigeration	0 01:21:23	28	0 00:02:54
SN1	nvoAlarm	Refrigeration	0 01:21:23	24	0 00:03:23
~RackA.SGr1.Cmp1	nvoAlarm	Refrigeration	0 01:21:23	14	0 00:05:48
~RackA.SGr1.Cmp2	nvoAlarm	Refrigeration	0 01:21:23	14	0 00:05:48
~RackA.SGr1.Cmp3	nvoAlarm	Refrigeration	0 01:21:23	14	0 00:05:48
Anti-Buee	nvoAlarm	Refrigeration	0 01:21:23	9	0 00:09:02
ALARM	nvoCntRelay1	Site	0 01:21:19	8	0 00:10:09
RTC	nvoAlarm	Site	0 01:21:23	4	0 00:20:20
Lighting	nvoAlarm	Lighting	0 01:21:23	2	0 00:40:41
~RackA.SGr1	nvoRqPower	Refrigeration	0 01:21:17	1	0 01:21:17
ALARM	nvoCntRelay3	Site	0 01:21:19	1	0 01:21:19
ALARM	nvoCntRelay4	Site	0 01:21:19	1	0 01:21:19
AHU	nvoReset	HVAC	0 01:21:23	1	0 01:21:23
ALARM	nvoReset	Site	0 01:21:23	1	0 01:21:23
Anti-Buee	nvoReset	Refrigeration	0 01:21:23	1	0 01:21:23

Order:

By Update Interval: Use to display the information in the window by ascending order of Update Interval.

By Update Interval: Use to display the information by ascending alphabetic Node name.

Column Headers Definition:

Elapsed Time: Indicate the time that the MT Alliance is running.

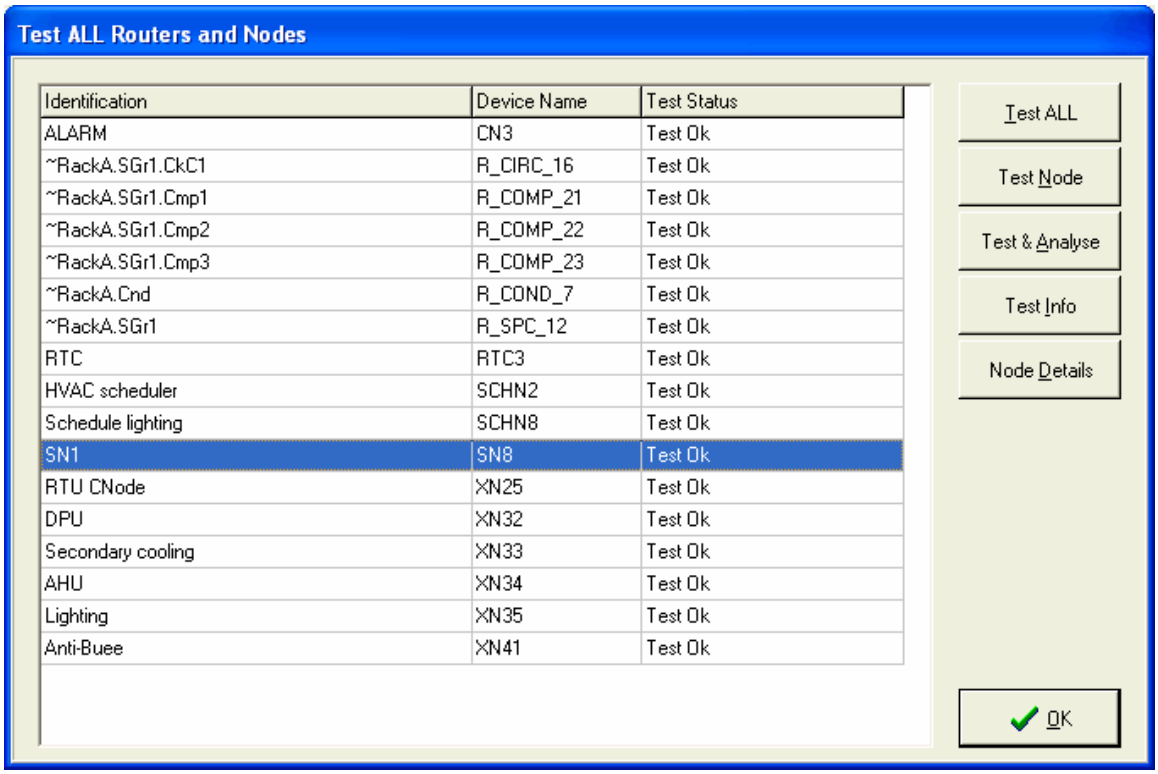
Number of Updates: Indicate the number of times that the network variable has been updated since the MT Alliance is running

Update Interval:

Indicate the average number of seconds between updates. The Elapsed Time must be at least 3 minutes to have good average Update Interval time.

Update Interval = Elapsed Time / Number of Updated.

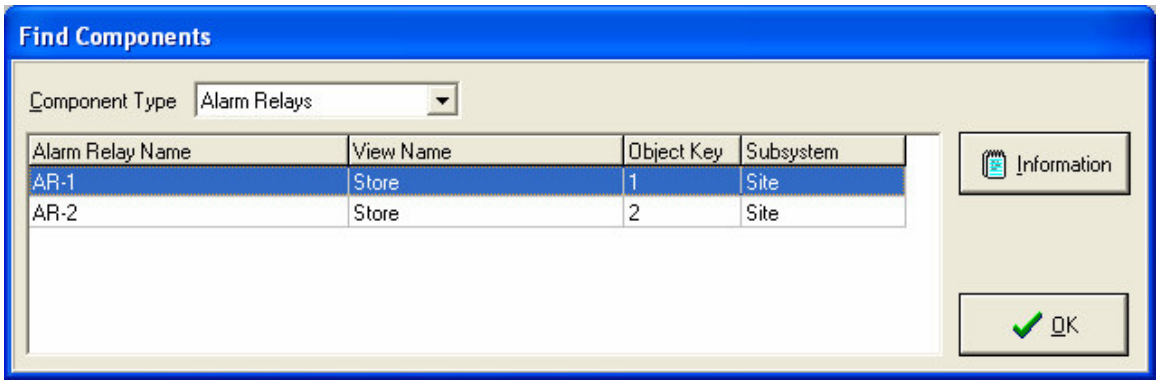
2.51 Test All Routers and Nodes



This window allows the technician to test the node on the LonWorks network. When the MT Alliance is started an automatic test is done on all nodes and the results are display in the window. At any time, the technician can use the buttons in the window to perform different types of test on the node

Test ALL: Allow testing of all the nodes installed on the LonWorks network. The results are shown when test are performed on all nodes.
Test Nodes: Allow to test specific nodes selected in the window.
Test & Analyse: Allow to test 4 times all nodes on the network. There is a long delay before the results are shown because all nodes are tested four times.
Test Info: Display the results of the test.
Node Details: Display specific information on the node.

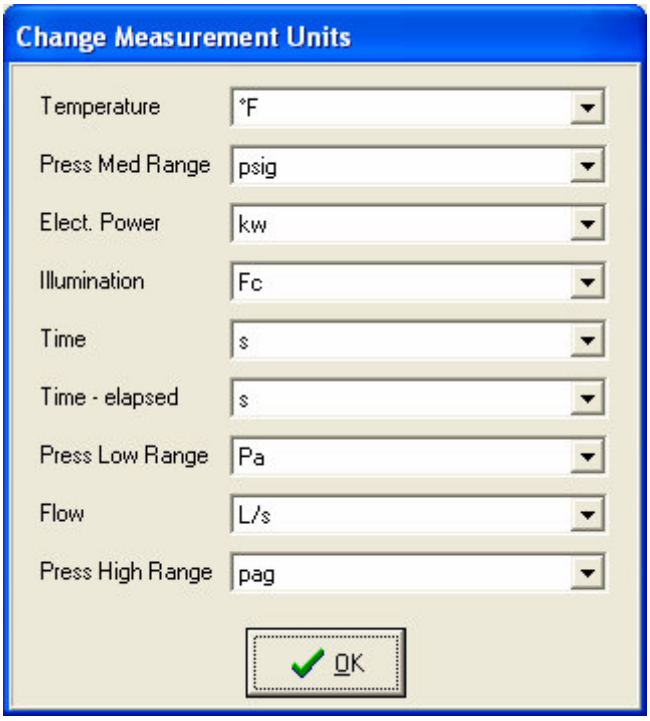
2.52 Find Components



From the Alliance menu, select "Tools" and then "Find Components", the previous windows will come up.

The "Find Components » tool allows you to locate any Component Type you can find in your system. If you know the type, the name or the subsystem of the component you want to locate in your MT Alliance views, you can use this tool to help. Once you have find the component you are looking for the MT Alliance will position himself in the right subsystem view and highlight the component you where looking for in Fuschia. Then you know exactly where is located your component in the store.

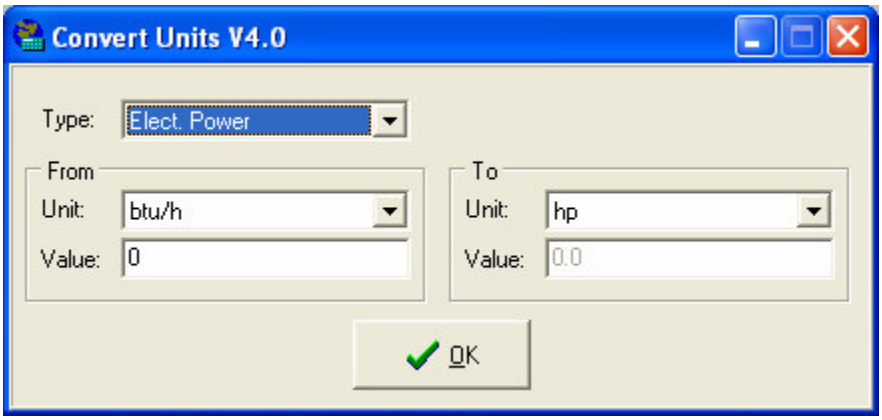
2.53 Change Measurements Units



From the Alliance menu, select "Options" and then "Change Measurements Units" or click on the "Earth" icon in the tool bar and the previous windows will come up.

The "Change Measurements Units" tool allows you to change any measure you can find in the MT Alliance software in a more friendly measure for you. If it happen that you prefer Celsius rather then Fahrenheit, you just need to change the measurement unit for the temperature and all temperature measure in the MT Alliance will be converted in Celsius instantly. You can change the measurement unit as often as you want; you only have to click on the "Ok" button to save your change.

2.54 Units Conversions

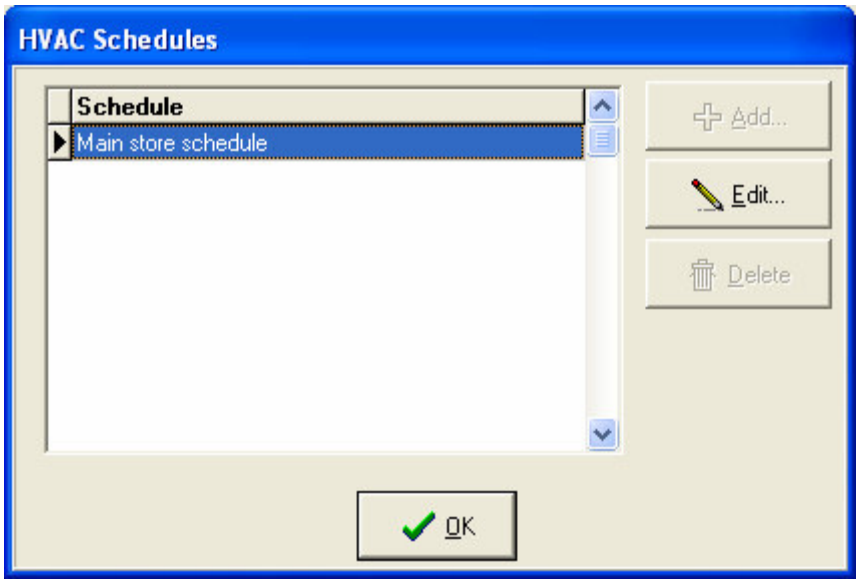


From the Alliance menu, select "Tools" and then "Units Conversion", the previous windows will come up.

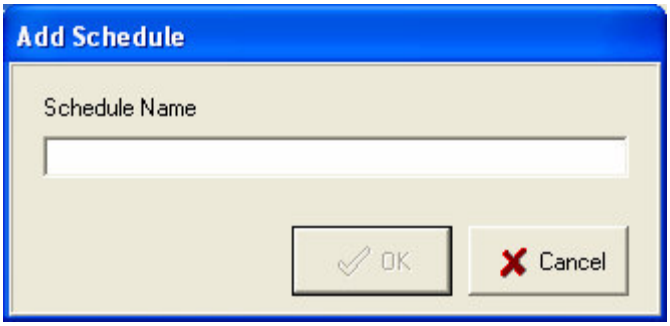
This little tool can be compare to a calculator. When looking at some product specifications you may find a measurements unit that doesn't mean anything to you. In order for you to convert them quickly, we added this tool. First select the type of measurement unit you want to convert. Then select the "From" unit type (the one you have on your product specifications) and the "To" unit type (should the measurement unit you are looking for). Once you have typed the value of the "From" measurement unit, you will instantly get the correspondent value in the "To" value field. Once you are done, simply click on the "Ok" button to close the tool.

2.55 Create HVAC Schedule

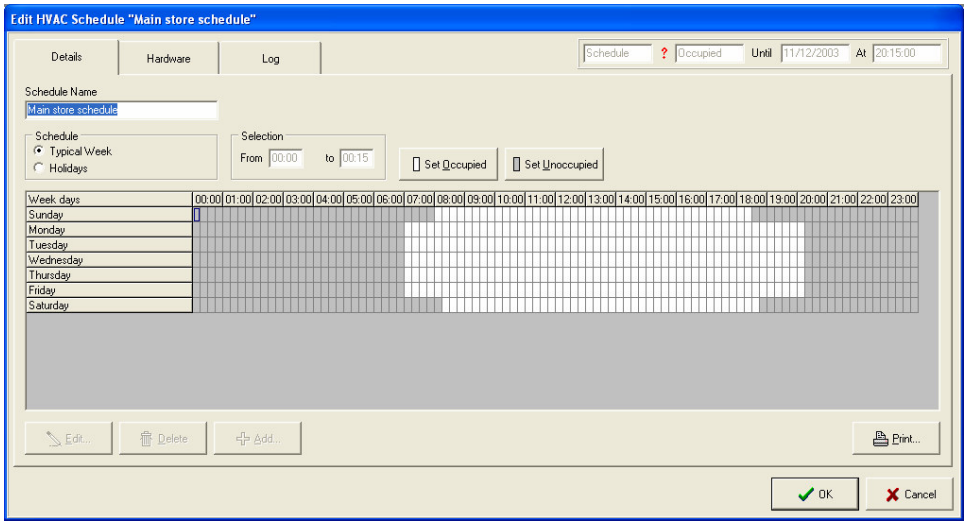
In order for you to be able to create a HVAC schedule you need to be set either in Maintenance or Configuration Mode. Then click on the "Schedule" button at the right side of the screen. The "HVAC Schedules" window shown below will appears.



Click on the "Add" button and the following window will appear on the screen. Give your new schedule a meaningful name and click the "Ok" button to go on the next step.



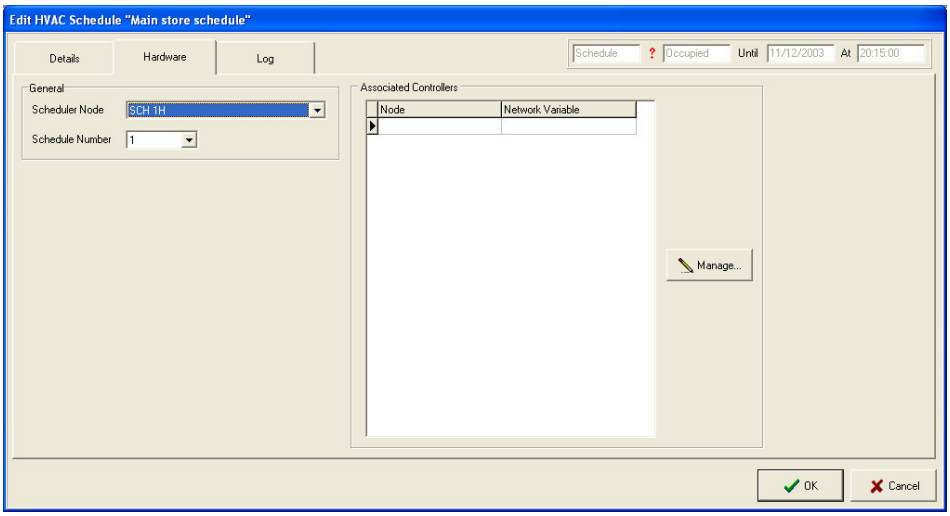
The "Edit HVAC Schedule" window appears as follow for a typical week. Please note that the name you gave to your schedule should appear in the "Schedule Name" field. Select a time range by clicking and dragging the mouse over the schedule. Select "Set Occupied" or "Set Unoccupied" as your selection. The result will look like the window below.

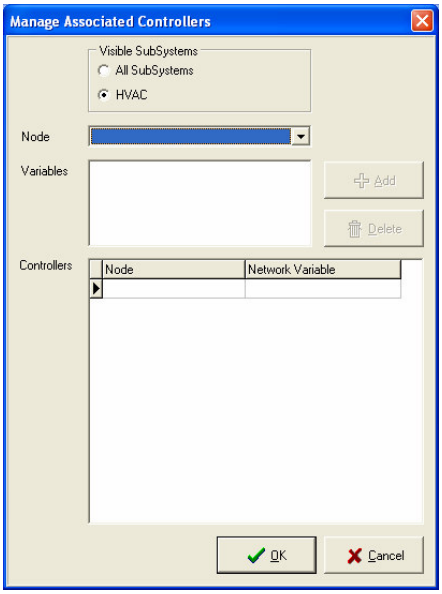


You can also define a schedule for holidays. This schedule will override the typical week schedule. In the "Schedule" frame right under the "Schedule Name", select "holidays" to be able to configure and add a holiday to your schedule. There are two types of holiday schedules. Those that can be repeated every year and those that are executed only on a specific year/month/day. The holiday schedule for only on specific day can override the repeat every year schedule.

If you want to add a periodic holiday, choose "Repeat Every" and select a date. If you want a holiday schedule to be executed only once, choose "Only On" and select a unique date. You will then see a new holiday schedule appear. Modify it to suit your needs just as you did for the typical week.

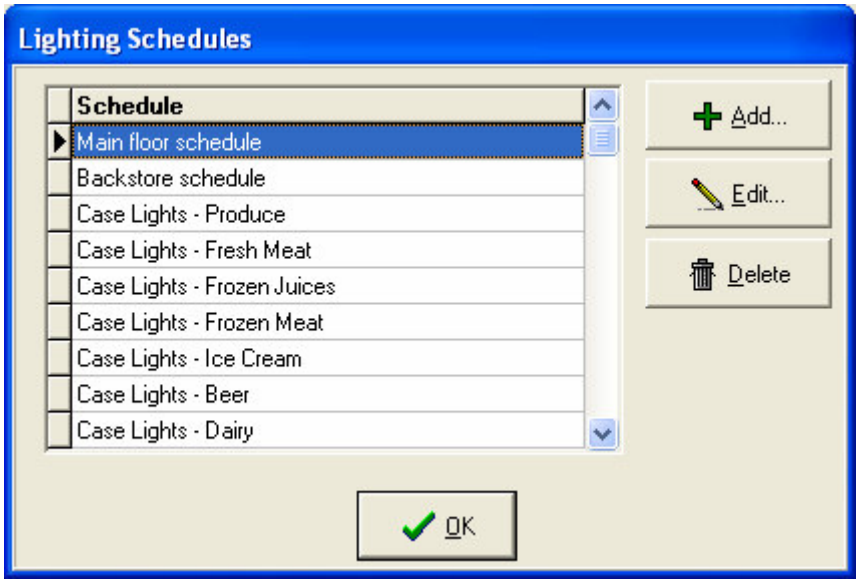
The hardware tab let you see technical specification of your HVAC scheduler. You need to select in the "Scheduler Node" field your HVAC Scheduler node. Then you need to click on the manage button to select the variables that will control your HVAC application.



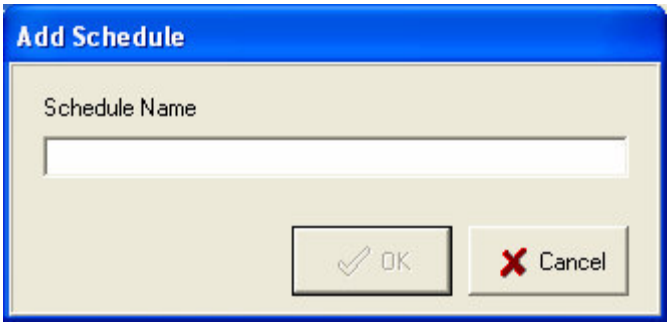


2.56 Create Lighting Schedule

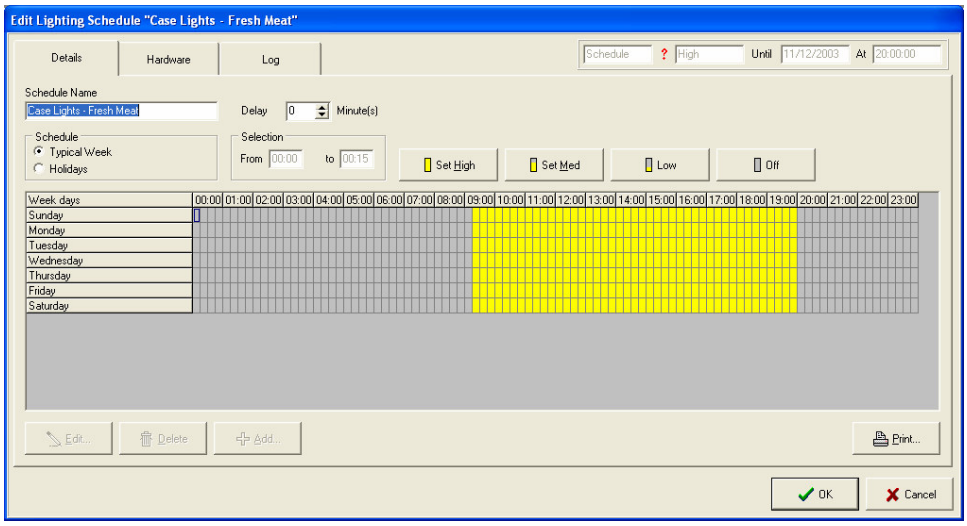
In order for you to be able to create a Lighting schedule you need to be set either in Maintenance or Configuration Mode. Then click on the "Schedule" button at the right side of the screen. The "Lighting Schedules" window shown below will appears.



Click on the "Add" button and the following window will appear on the screen. Give your new schedule a meaningful name and click the "Ok" button to go on the next step.



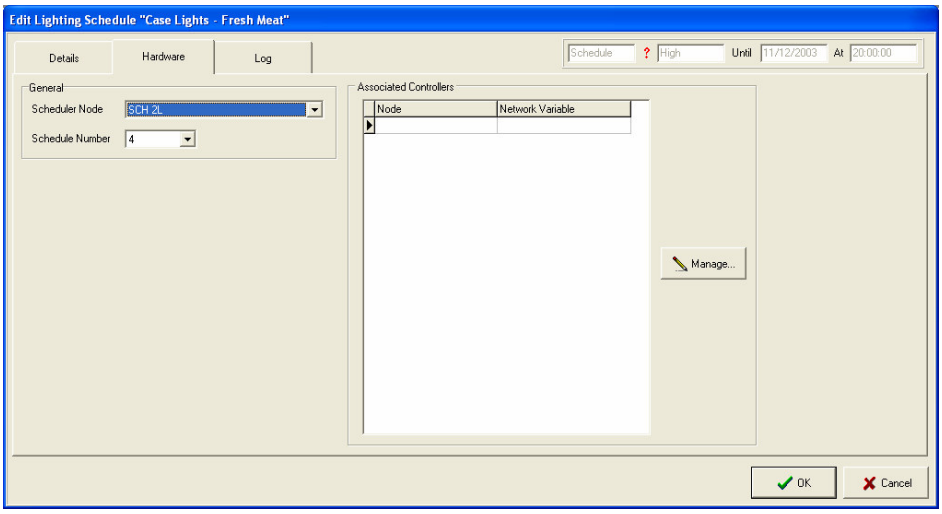
The "Edit Lighting Schedule" window appears as follow for a typical week. Please note that the name you gave to your schedule should appear in the "Schedule Name" field. Select a time range by clicking and dragging the mouse over the schedule. Select "High, Med, Low or Off" as your selection. If Lighting controller allow only On/Off control, the choice Med and Low is equivalent to High. The result will look like the window below.

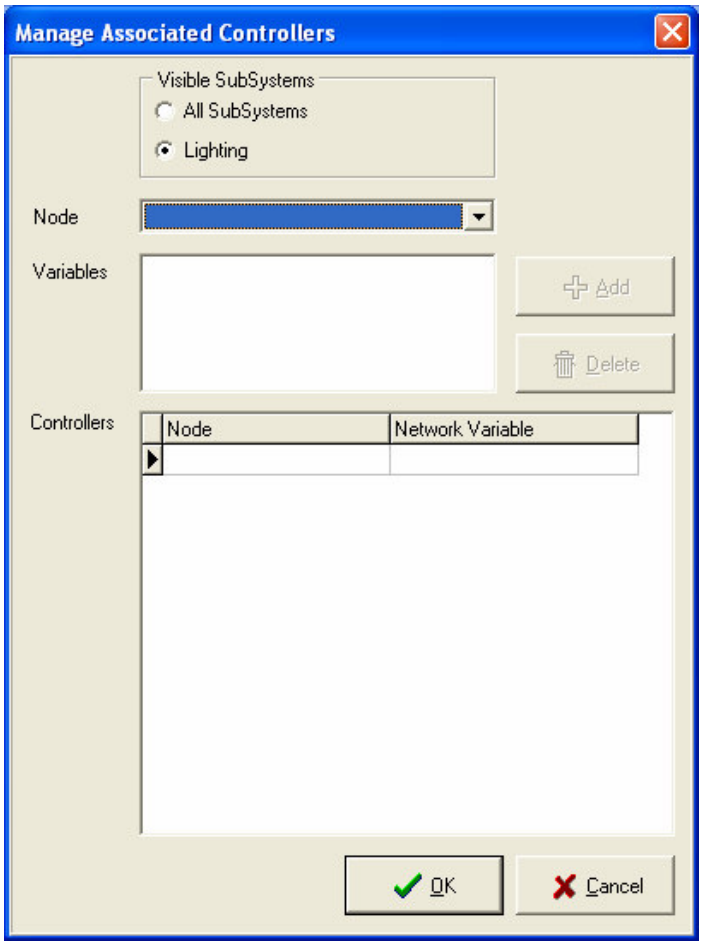


You can also define a schedule for holidays. This schedule will override the typical week schedule. In the "Schedule" frame right under the "Schedule Name", select "holidays" to be able to configure and add a holiday to your schedule. There are two types of holiday schedules. Those that can be repeated every year and those that are executed only on a specific year/month/day. The holiday schedule for only on specific day can override the repeat every year schedule.

If you want to add a periodic holiday, choose "Repeat Every" and select a date. If you want a holiday schedule to be executed only once, choose "Only On" and select a unique date. You will then see a new holiday schedule appear. Modify it to suit your needs just as you did for the typical week.

The hardware tab let you see technical specification of your Lighting scheduler.
First, you need to select in the "Scheduler Node" field your Lighting Scheduler node. Then you need to click on the manage button to select the variables that will control your Lighting application.
Second, if you have a photocell, you will be able to connect your photocell to the Lighting controller.





Revision History

REV	Description	Revised By	Date
1.0	Document Creation and Formatting	CBC	9 oct. 03
1.1	Revision TT Group	JRT, JG	15-jan-04
2.0	Final Revision	JG	19-jan-04
2.1	Revision TT Group and CBC for formatting and Lighting	JRT, CBC	21-jan-04
3.0	Release of the manual	CBC	27-jan-04