Configure Nimbus for remote admin using ActiveX components

Since Nimbus Explorer mainly is for use locally where the Nimbus Server is installed there are ActiveX components which may be embedded in SCADA system graphics for a more integrated solution.

These components are a component-variant of the most used forms: *Receiver Setup, Route Profiles Setup, Active System Log, Main Window and the Text Message form*.

Communication between the components and the Nimbus Server is a single TCP/IP socket.

Upgrade to the latest version of Nimbus version 3 to ensure it supports the components.

Install the components

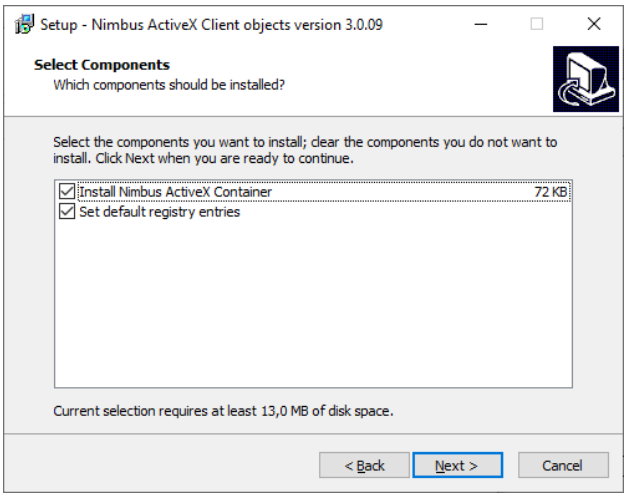
Download and install the components, they can be found here:

https://drive.google.com/file/d/1j5IKicZ1I5DeN%2DxbzG2cXFdDh35rXH6n

The name of the components setup is *Nimbus ActiveX Client Objects 3.00.xx.zip*

The Zip-file is encrypted and the password is: *nimbus*

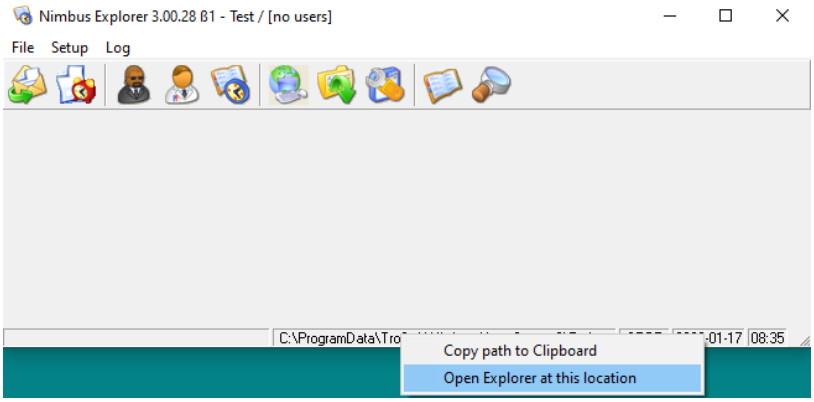
Select what to install (the components are always installed). Optionally there is a small container useful for testing the components.



The components must be installed on every client computer that intends to use them

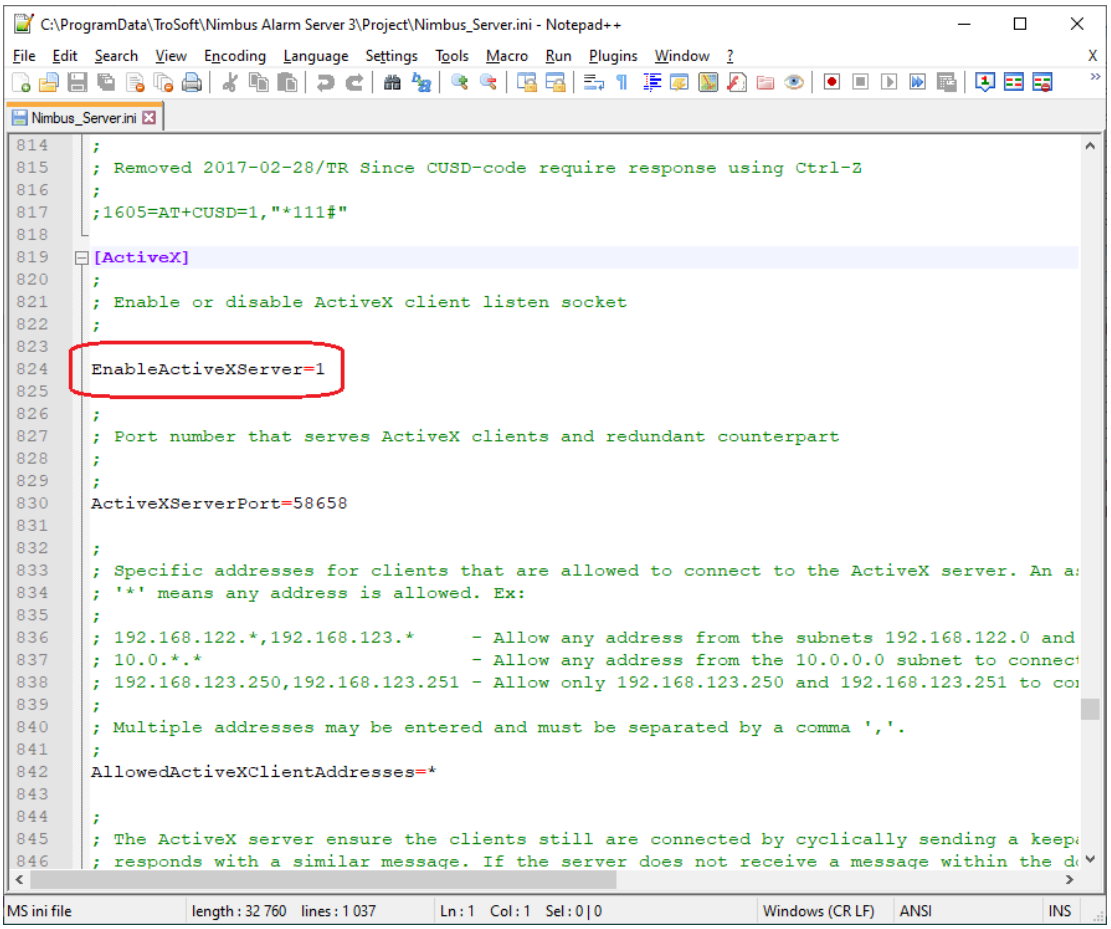
Configure Nimbus Server to allow the components to connect

The internal ActiveX data provider in Nimbus Server needs to be enabled in the *Nimbus_Server.ini* file.



Right click the Project folder path down right in Nimbus Explorer and open Explorer directly in the project folder.

Open the *Nimbus_Server.ini* file using ex Notepad.



Find the *EnableActiveXServer* parameter and set it to *1*

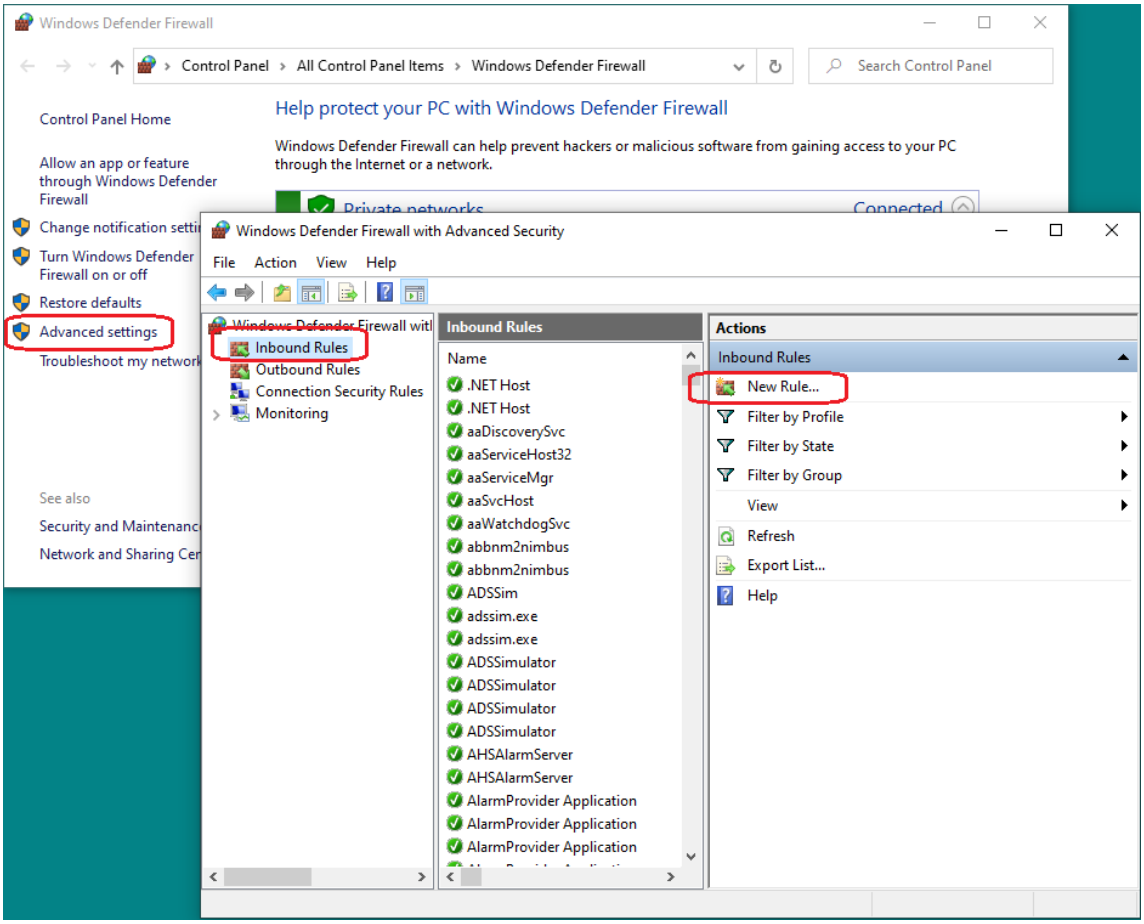
Save the file and restart Nimbus Server

If configuring a redundant system, be aware that for now, the ActiveX-components are only able to connect to one server (the primary server)

Configure Windows Defender Firewall

The Nimbus Server (*NimServer.exe*) will act as a TCP socket server on port 58658. The ActiveX components act as TCP clients. If the components are to be installed and used on another machine (which probaly is the case) then a firewall rule is needed in the Nimbus Server machine.

Open *Windows Defender Firewall -> Advanced Settings -> Inbound Rules -> New rule*



Select *Port,* click *Next*

Select *TCP* and *Specific local ports,* enter the portnumber 58658, click *Next*

Select *Allow the connection*, click *Next*

Select desired network profiles (*Domain, Private, Public*) , click *Next*

Name the rule something logical, ex *Nimbus ActiveX*, click *Finish*

The portnumber may be changed in Nimbus_Server.ini if needed. Parameter *ActiveXServerPort*. imbus Server needs to be restarted if the port number is changed.

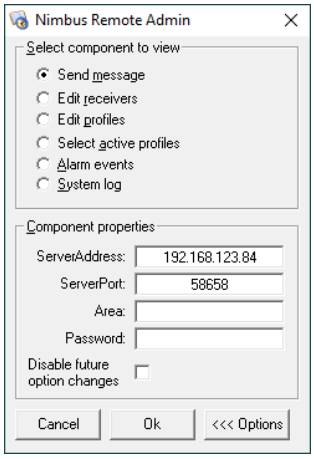
If there are any physical firewalls between the client(s) and the Nimbus Server they also need to be opened.

Testing the components and connection using NimbusContainer.exe

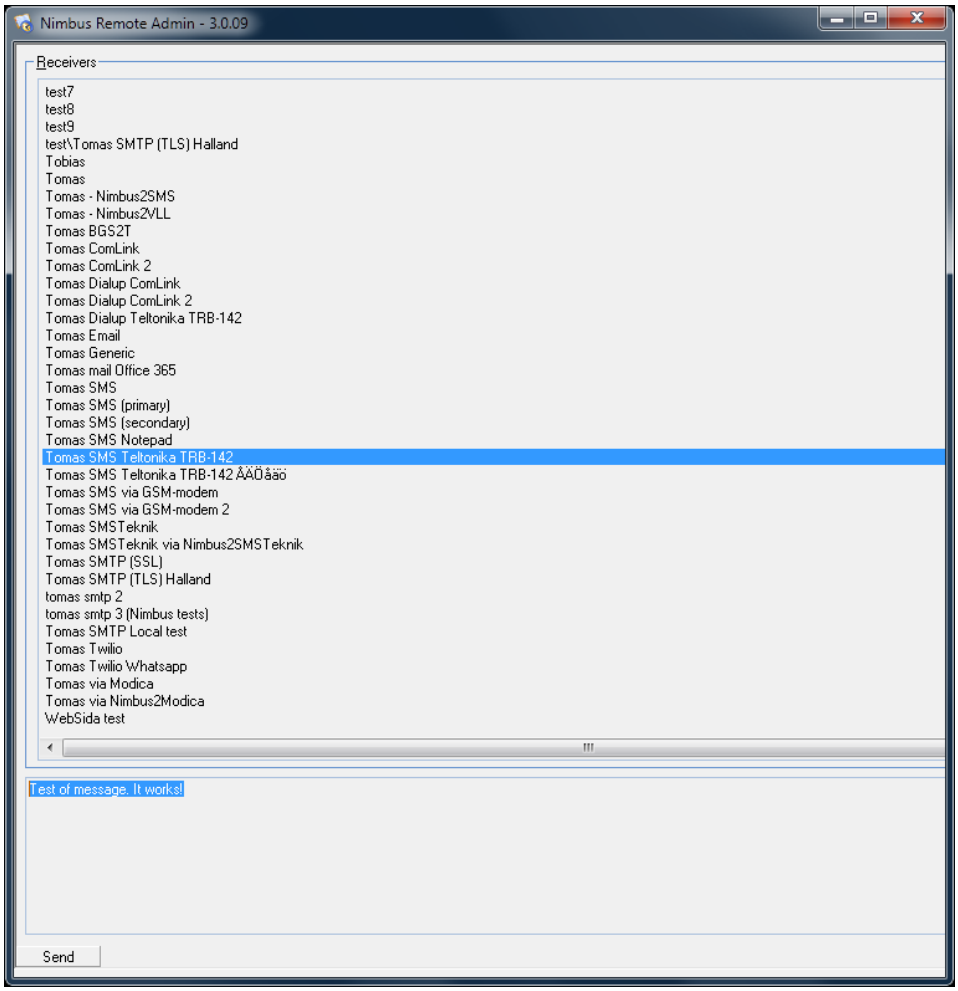
Open the small test container *Nimbus Remote Admin* on the client machine and select *Options*.

Enter the servers' IP (or DNS name) and the port 58658.

Select any of the components and OK. Here we select to send a text message.



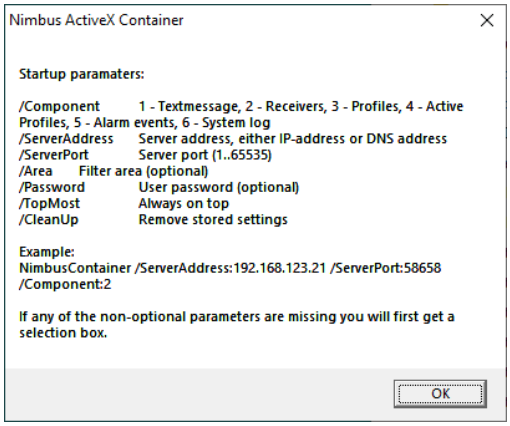
If the connection is ok then the component form will show up



Select one or more receivers, enter some text below and click *Send* to send a message.

This component might be used at the client if the components are not to be embedded in the SCADA graphics or if the SCADA is having problems with the components.

It also have some c*ommand line* parameters, which means it is possible to create shortcuts to directly open ex *Active Profiles*. Start NimbusContainer.exe with */?* to see the parameters.



Adding components to the SCADA graphics

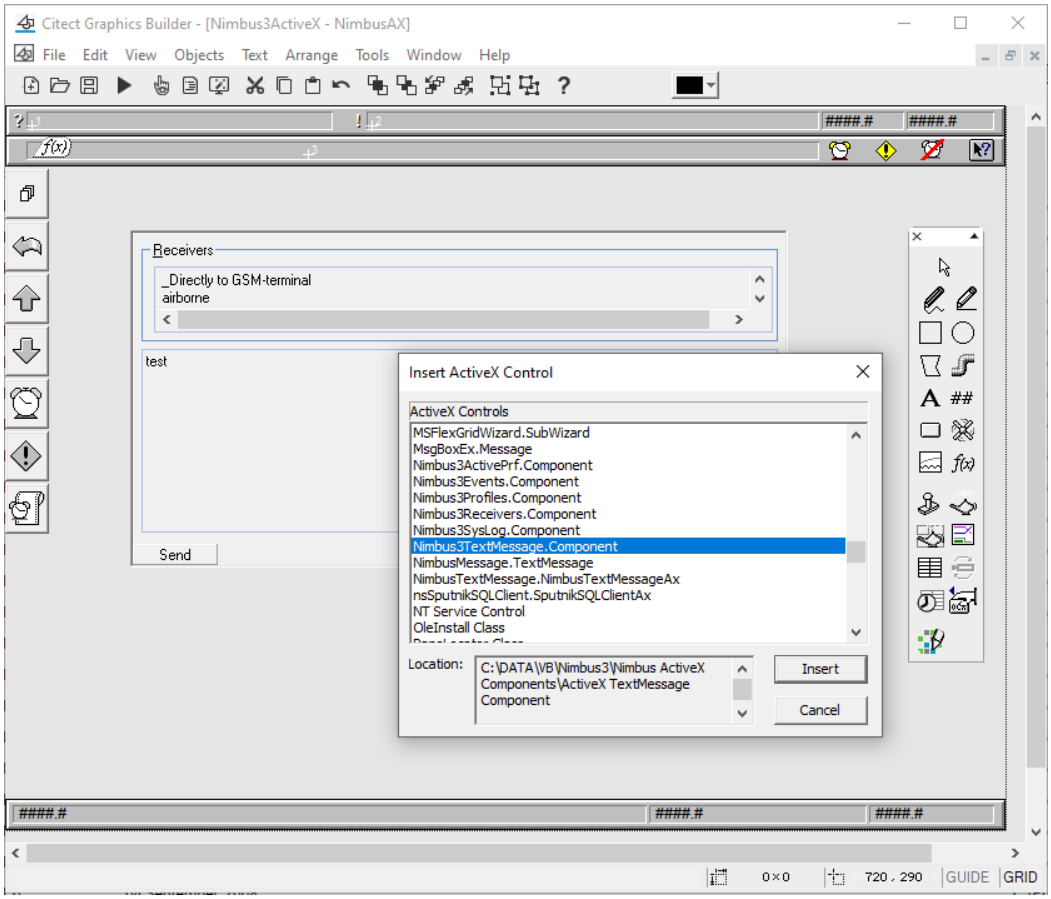
In many SCADA systems it is possible to insert ActiveX-components directly into a graphics page.

However some of them don't work very well with these components. If you experience problems it is better to let the SCADA start the NimbusContainer wrapper using some script and passing in the appropriate command line parameters to connect an view the correct component.

Especially the */TopMost* parameter is more or less mandatory or the user will eventuelly end up with a lot of instances hidden behind the SCADA.

Adding components to the SCADA graphics – Citect Example

Select the OCX-tool, browse for the *Nimbus3*-components.



The property *ServerAddress* and *ServerPort* needs to be set or the component will not find the server.

Citect only allows properties to be set using tags. In the above example the properties are set in the Registry, see later on *Configure server adress and port properties using Registry*

Another method to create the components and set the *ServerAddress* and *ServerPort* is to use CiCode. Call the desired CiCode(s) using the pictures' *On Page Entry* event.

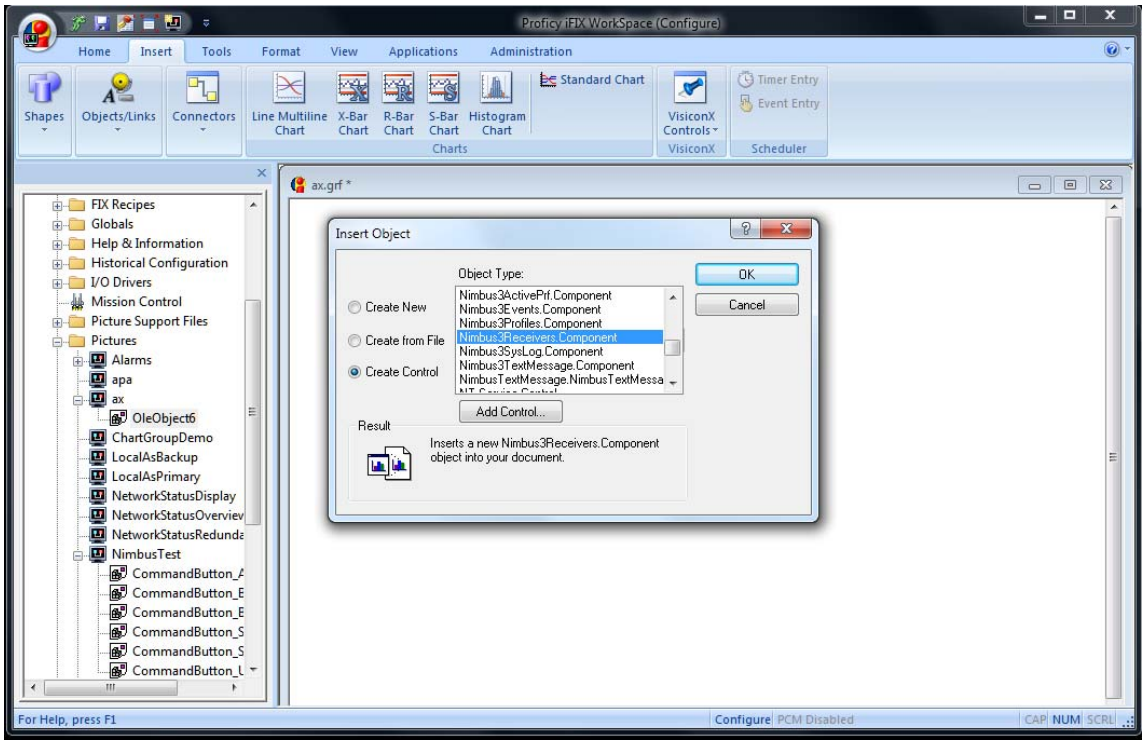
Here is some sample CiCode (some of the rows are broken in the document but should be put toghether in the CiCode editor):

```
//
// Creates Nimbus 3 ActiveX Objects
//
//
// Date       / Vers  / Sign / Desc
// ------------------------------------------------------------------------------------------
// 2018-10-10 / 01.00 /  TR  / Main - recreated since I did not find the old Nimbus 2 code
//
//
//
// ------------------------------------------------------------------------------------------
//
// Properties ServerAddress and ServerPort are also set in the registry at location:
// HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\TroSoft\Nimbus ActiveX Client\Version 3
//
// If ServerPort is set to 0 in the registry, the component will not connect until we set the
// property here below
//
// ServerAddress could be the IP or the DNS name and could be set using a parameter and
// function ParameterGet() to make it easier to change
//
// Call these functions from the On Page Shown event
//
// To enable ActiveX the components must first be installed and the parameter
// EnableAvtiveXServer in Nimbus_Server.ini must be set to 1
//
// There are also Area and Password properties. Area may be used to split a Nimbus using
// regions (Areas), ex:
//
// Area=Norr will place Norr\ as prefix to each receiver and profile.
// Only the users belonging to Area Norr (or no area at all will) see its profiles and
// receivers.

OBJECT hNimbusActivePrf;
OBJECT hNimbusProfiles;
OBJECT hNimbusReceivers;
OBJECT hNimbusTextMessage;


FUNCTION CreateNimbusReceivers()

  hNimbusReceivers = CreateControlObject("Nimbus3Receivers.Component", "NimbusReceivers", 24,
168, 520, 461, "NimbusReceiversEvent");

  SetNimbusProperties(hNimbusReceivers);

END

FUNCTION CreateNimbusTextMessage()

  hNimbusTextMessage = CreateControlObject("Nimbus3TextMessage.Component",
"NimbusTextMessage", 24, 472, 520, 776, "NimbusTextMessageEvent");

  SetNimbusProperties(hNimbusTextMessage);

END

FUNCTION CreateNimbusActivePrf()

  hNimbusActivePrf = CreateControlObject("Nimbus3ActivePrf.Component", "NimbusActivePrf", 24,
784, 520, 1008, "NimbusActivePrfEvent");

  SetNimbusProperties(hNimbusActivePrf);

END

FUNCTION CreateNimbusProfiles()

  hNimbusProfiles = CreateControlObject("Nimbus3Profiles.Component", "NimbusProfiles", 528,
168, 1648, 1008, "NimbusProfilesEvent");
```

```
  SetNimbusProperties(hNimbusProfiles);

END

FUNCTION SetNimbusProperties(OBJECT hNimbusObject)

  _ObjectSetProperty(hNimbusObject, "ServerAddress", "localhost");
  _ObjectSetProperty(hNimbusObject, "ServerPort", 58658);

END
```

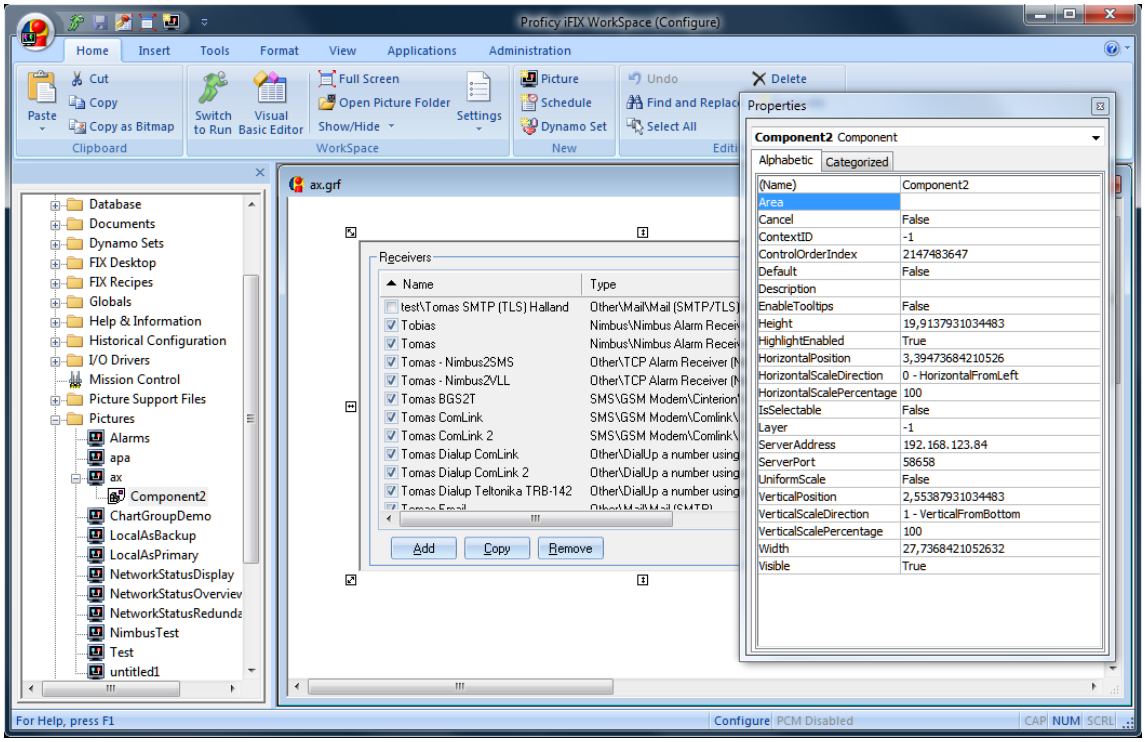
Adding components to the SCADA graphics – iFix Example

Select Objects/Links and OLE objects. Browse for the *Nimbus3*-components.



Set the Property *ServerAddress* and *ServerPort* and the component should connect.

Be aware that iFix sometimes does not seem to preserve the properties. If that is the case the properties needs to be set using a script or set in the registry (see later on *Configure server adress and port properties using Registry*)

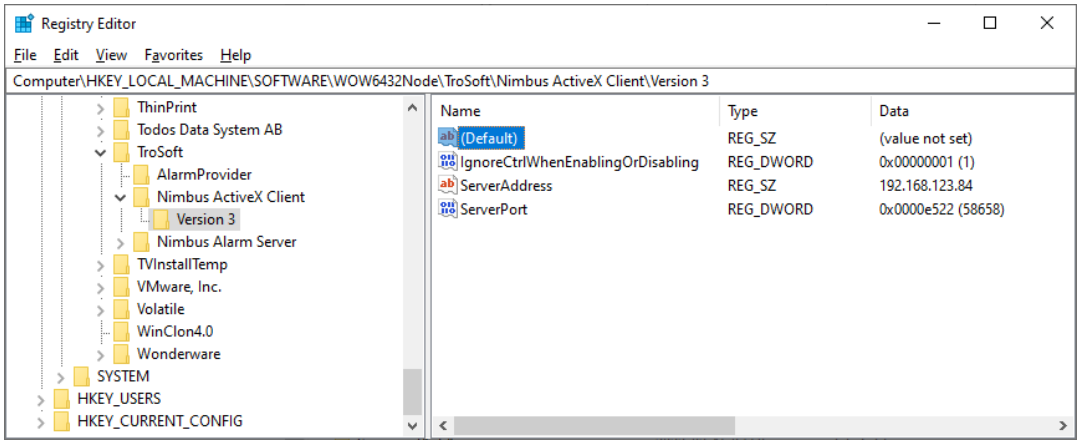


Configure server adress and port properties using Registry

For the components to find the Nimbus Server they need property *ServerPort* and *ServerAddress* to be set.

Some SCADA systems have problems setting properties on components, hence these also could be set in the registry:

Computer\HKEY_LOCAL_MACHINE\SOFTWARE\WOW6432Node\TroSoft\Nimbus ActiveX Client\Version 3



If set here, there is no need to set the properties using the SCADA graphics.

When the component is created it will first read the registry settings, then it will wait 100 ms for the properties to be set by the SCADA (either directly or using a script). If these are not set by the SCADA within this time, then it will connect using the registry settings. If the registry settings does not exist (or *ServerAddress* is empty or *ServerPort* is 0) the component will wait 2000 ms for the properties to be set by the SCADA before considering connection has failed.

Configure redundancy for the components

Components from version 3.00.10 will support redundancy.

To set primary and secondary server address, the ServerAddress property should be set to both server's address delimited by comma, ex:

ServerAddress="192.168.123.84,192.168.123.86"

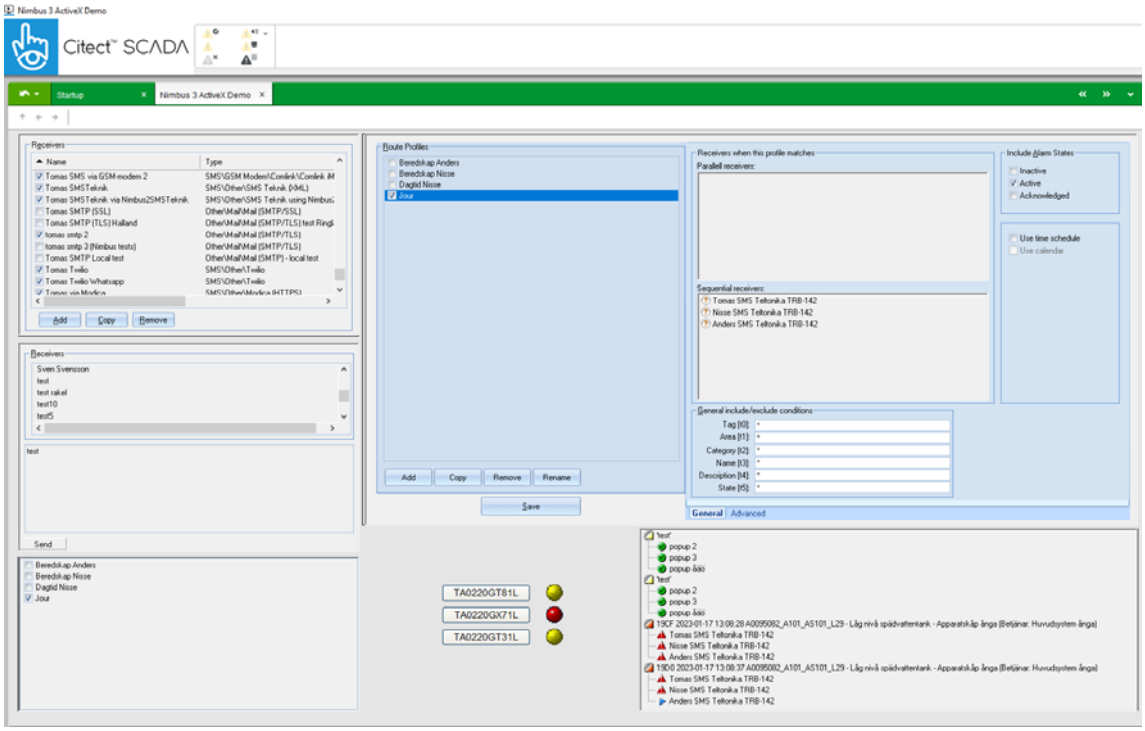
The component will always first try to connect to the primary server. If this fails within 2000 ms the component will try the secondary server before it will indicate a permanent fail.

If the component is connected to a server and the server closes the connection (due to a shutdown or error) the component will not switch to the other server. The component has to be reloaded to connect to the other server (ex by changing the SCADA picture forth and back again).

Live example in Citect

Here are view of all components but the Nimbus3.SysLog component.

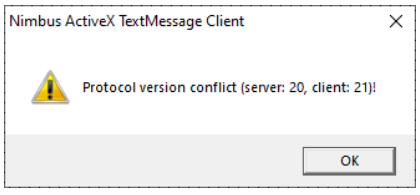
The component Nimbus3.ActivePrf component down left is very useful when the user should only be able to enable/disable a profile without doing any other changes to it.



Version differences

The ActiveX components may support a different protocol version than the Nimbus Server. It is recommended to use the latest version of them both.

If the protocol version differs there will be an error message shown when the component is trying to connect:



Nimbus Server version 3.0.11..3.0.17 support protocol version 20
ActiveX components version 3.0.00..3.0.05 use protocol version 20

Nimbus Server version 3.0.18..3.0.29 support protocol version 21
ActiveX components version 3.0.06..3.0.10 use protocol version 21