APPLICOM® OPC for GEM80 Version 3.6
Installation Guide Issue 1

This is a basic guide to using the applicom® Software Version 3.X supplied in with the GTL-ETHERNET product.
It is not intended to cover the configuration of your selected SCADA package, but will provide sufficient information to allow configuration of the applicom® card. It also details OPC and DDE test that can be performed to prove card operation before the SCADA is configured.

INSTALL THE HARDWARE AND APPLICOM SOFTWARE

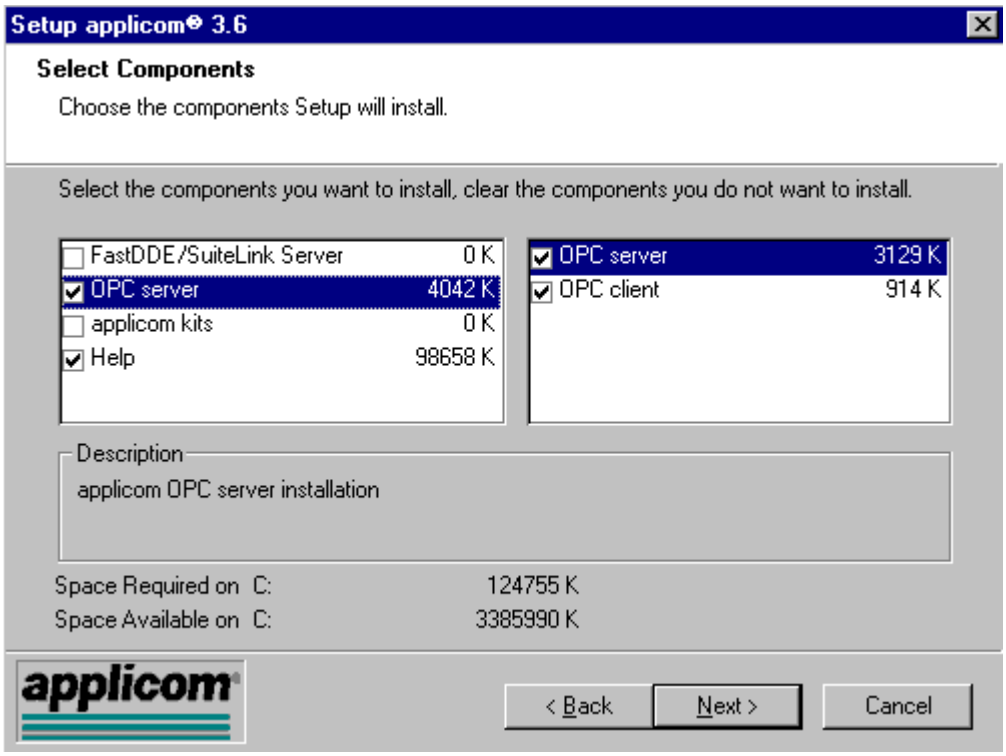
To install the product you may require administration rights, this will depend upon your operating system.

Fit the PCI1200ETH card into any available PCI slot in your PC observing static precautions.
Depending upon the operating system, when you power up the PC it should detect the new hardware (Win98 & 2000 - Not NT). Cancel any request to search for a new driver and install the card at this stage.

Instead insert the applicom® CD supplied which should auto run, if not run the SETUP.EXE file. After entering initial registration information you need to select the following: -

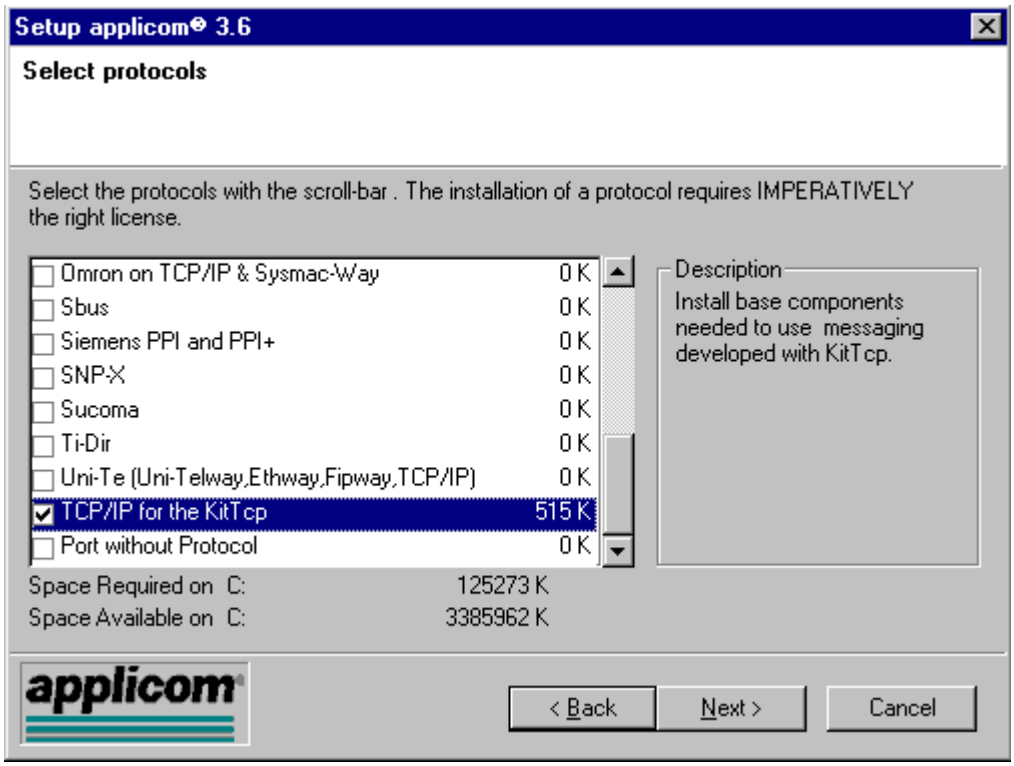
- Select the Language you require
- Install Products
- Install APPLICOM HARDWARE SOLUTIONS 3.6

You will be asked to Select Components for installation, select as shown below.



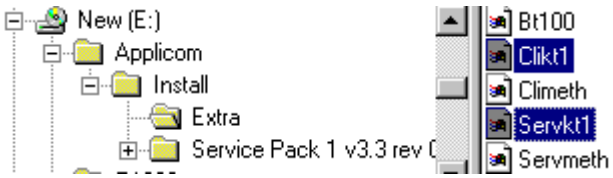
After selecting the above Components, **Next** to proceed.

This launches the set-up window in which you select the Communication Driver to be used, for GEM80 500 and GEMLAN-T it will be TCP/IP for the Kit Tcp as shown below.



Proceed with **Next** upon which the installation starts, saving the files to the default applicom® Directory. Upon completion the PC will have to be powered off / on in order for the changes to be accepted. The PC should power up with no errors.

The next requirement is to copy the **TWO** extra files supplied **on the second ALSTOM disk** (Clikt1 & Servkt1) to the applicom® Default Directory. The files are located in the APPLICOM – EXTRA folder as shown below.



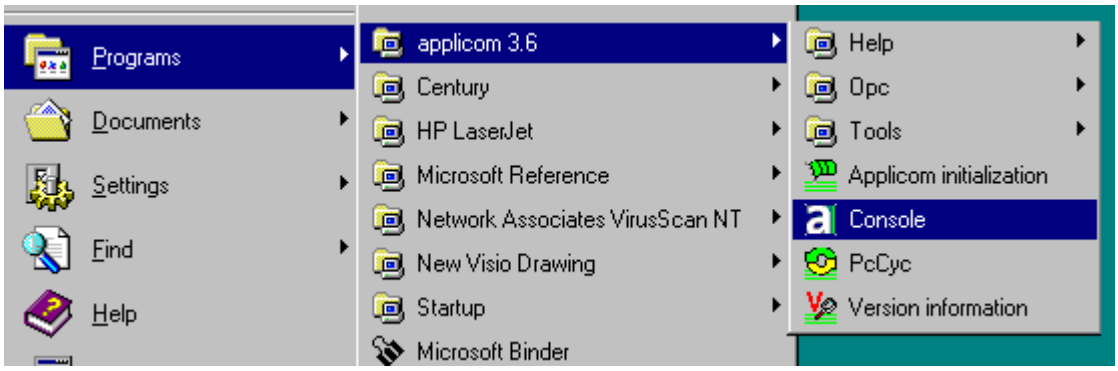
Use Windows CUT / PASTE to copy the above files and place them in the following location:

C:\PROGRM FILES \APPLICOM \APPLICOM3.6

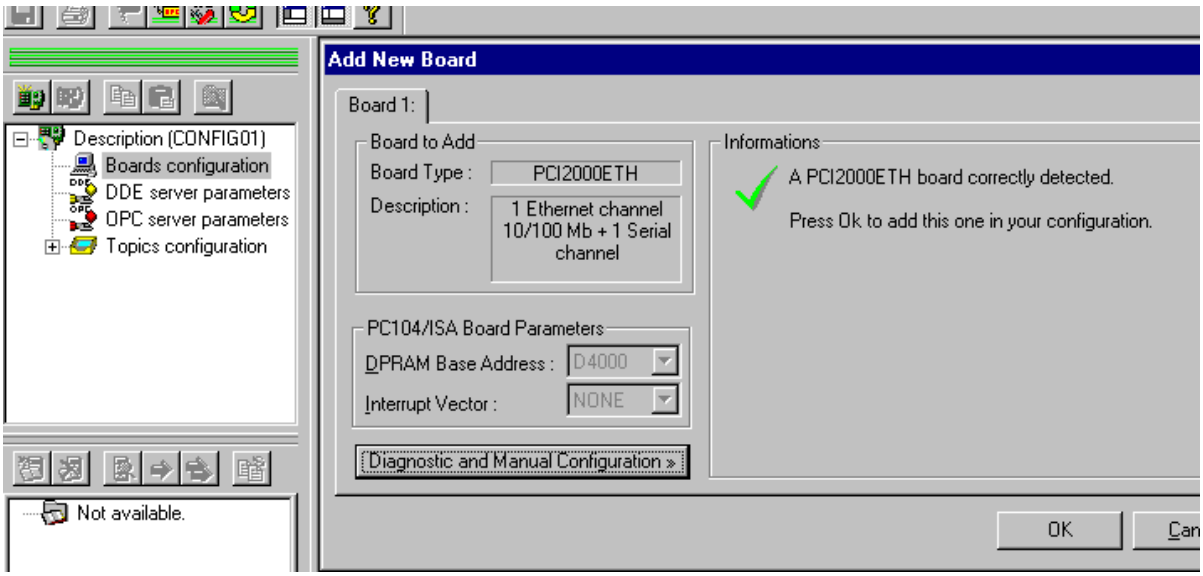
This completes the installation of the PCI1200ETH Board and applicom® Software.

CONFIGURATION of the PCI1200ETH Board IP ADDRESS and PROTOCOL
Using applicom® CONSOLE

Launch the APPLICOM Console Utility.



When the APPLICOM Console window is open highlight **BOARD CONFIGURATION**, right mouse click and select **ADD Board**.

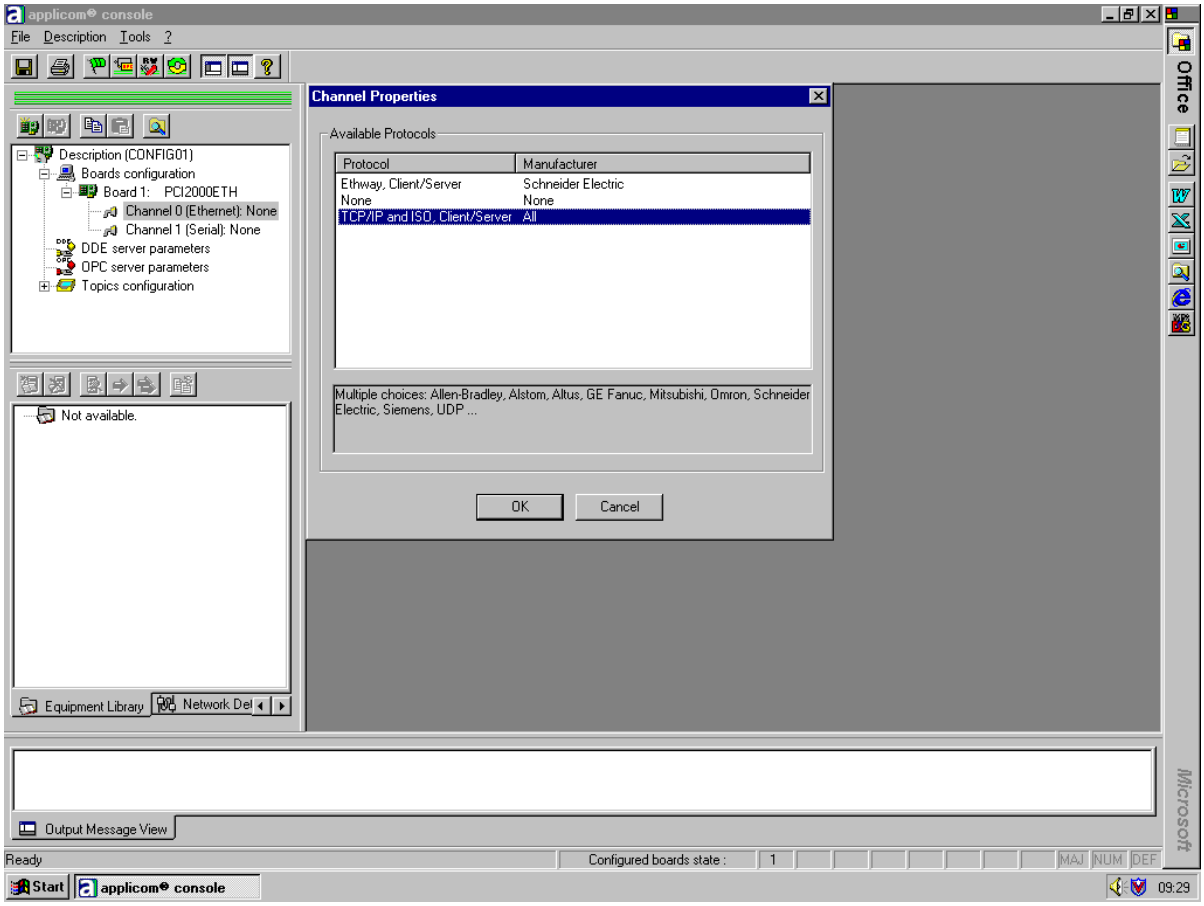


The above display should appear. It shows that the board has been detected correctly, select **OK** to continue.

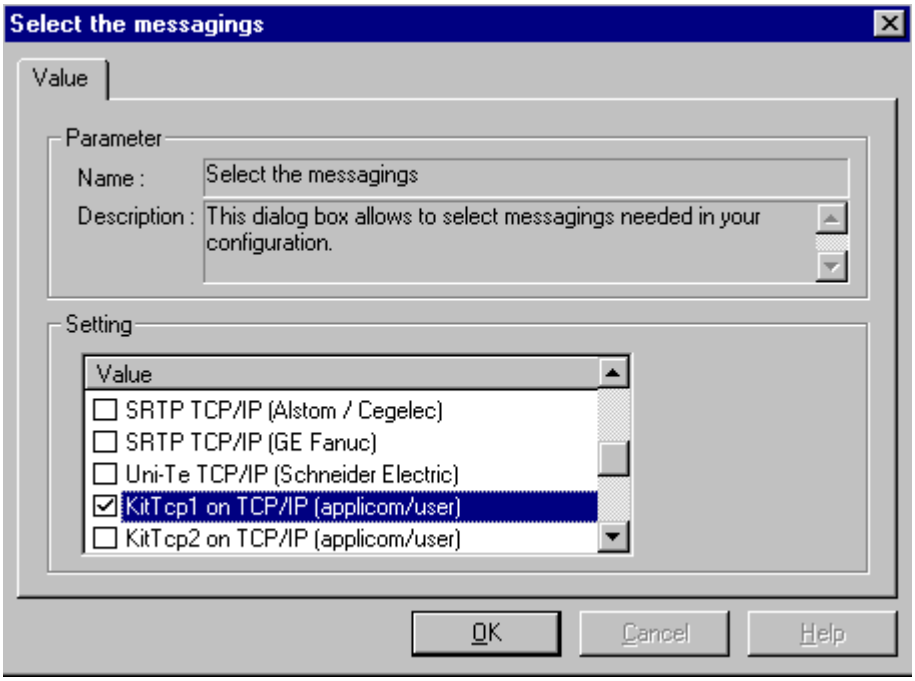
This will add BOARD 1 as PCI1200ETH and expand the tree to show this along with Channel 0 (Ethernet) and Channel 1(Serial) under Boards configuration.

The next steps select the protocol for use on Channel 1 (Ethernet) to allow communication with the GEM80 500 or GEMLAN-T and configure the board IP Address.

Double click Channel 0 (Ethernet) to open the channel properties. Select TCP/IP and ISO as shown below.



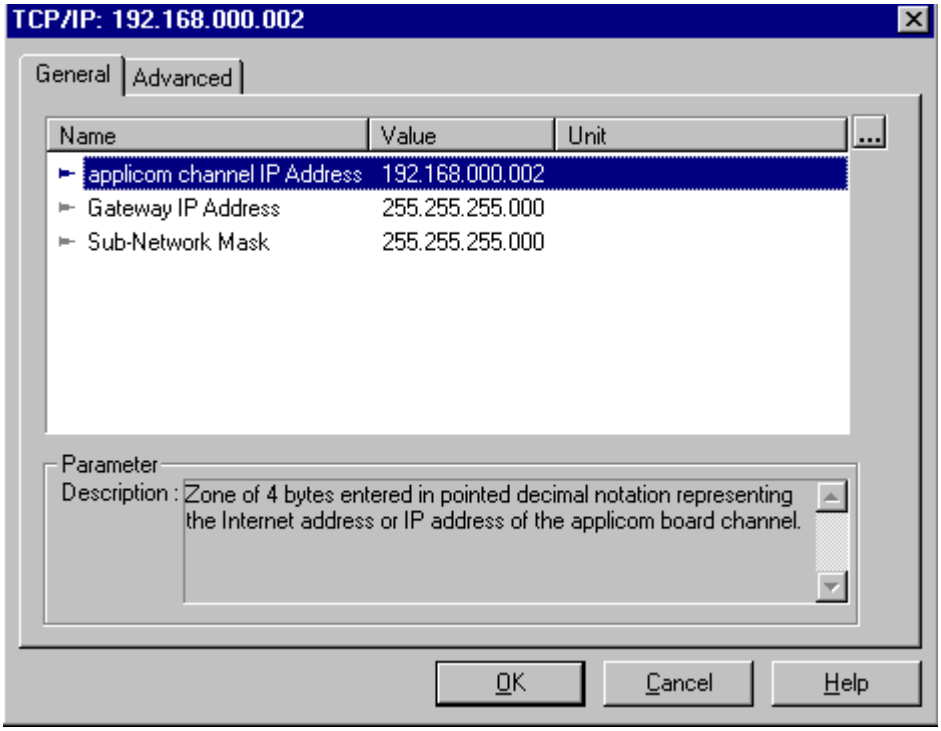
Select **OK** to continue which will open "Select the Messaging" Window shown below, this selects the GEM protocol.



Ensure Kit Tcp1 is selected as shown before **OK** to continue. You will be asked to confirm your selection before it proceeds.

The TCP/IP Configuration window will now open allowing the user to set the IP Address, Gateway and Subnet mask of the applicom® PCI1200ETH card.
These settings are independent of any other network cards fitted into the PC and should be obtained via your company IT Department to avoid network problems.

The settings shown below are an example only.



Once set **OK** to continue.

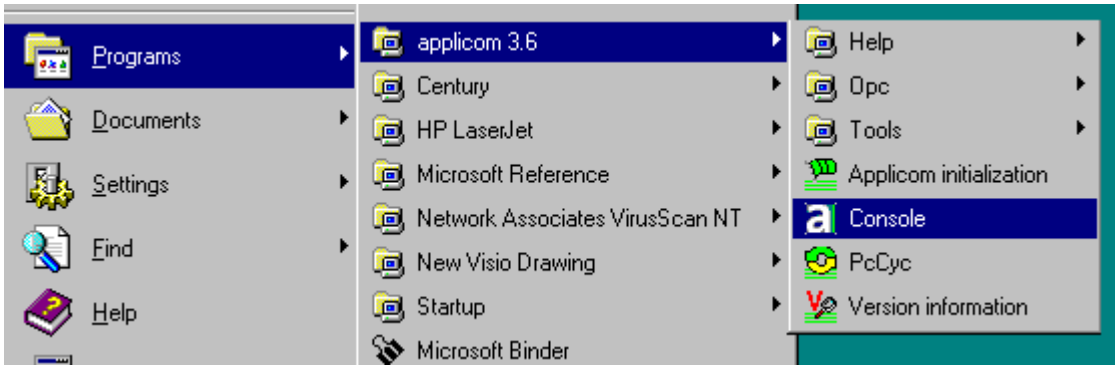
This generates a tree (right hand side) showing the card configuration and server equipment tag. At any time you can double click these to change the configuration.

At this stage we need to save the configuration and power down the PC for the IP Address to be used on the applicom® card. This only has to occur once unless the IP PCI1200ETH IP Address is changed at a later date, in which case you will be prompted to power off / on again.

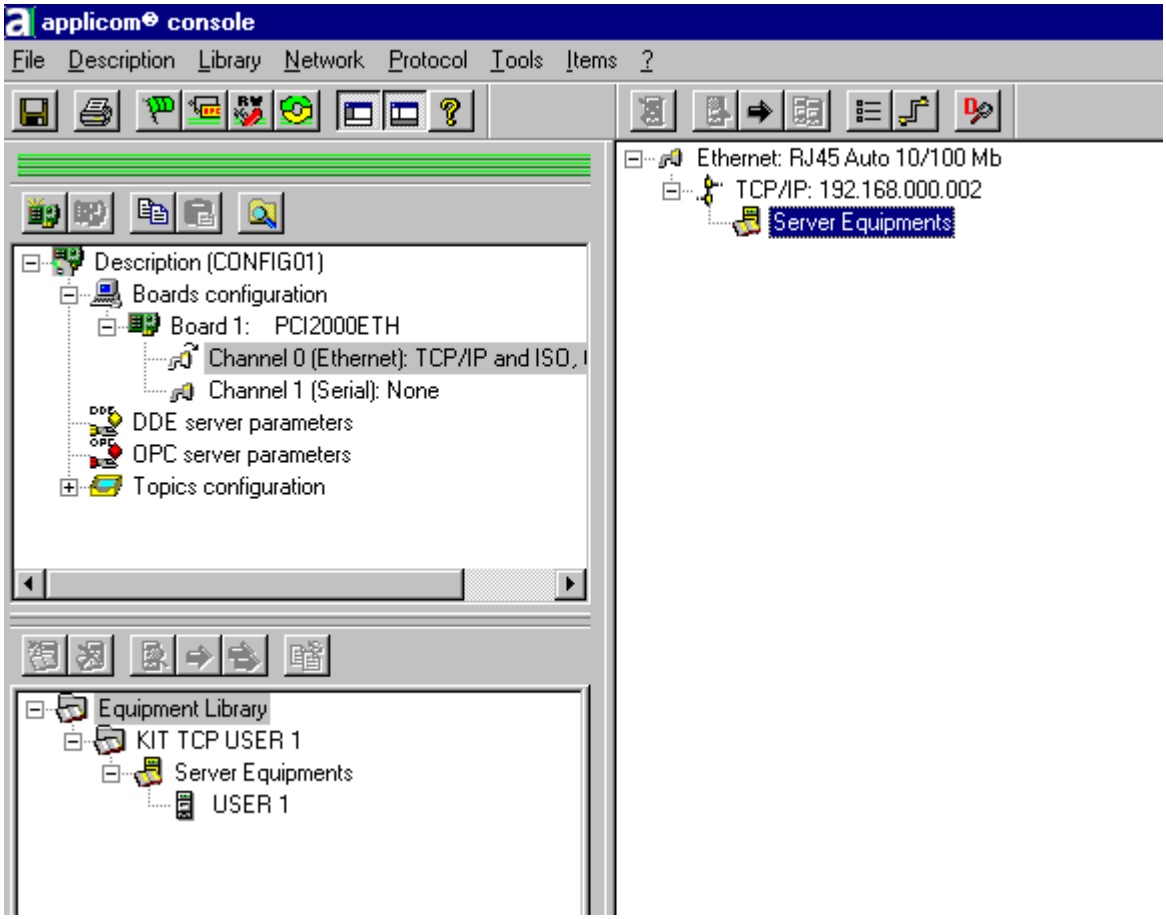
The next stage is to identify the external equipment i.e. GEM80 to which you want to communicate.

Identifying External equipment to which the applicom® PCI1200ETH board will communicate, using applicom® CONSOLE

After the PC Powers up return to the APPLICOM CONSOLE Utility.



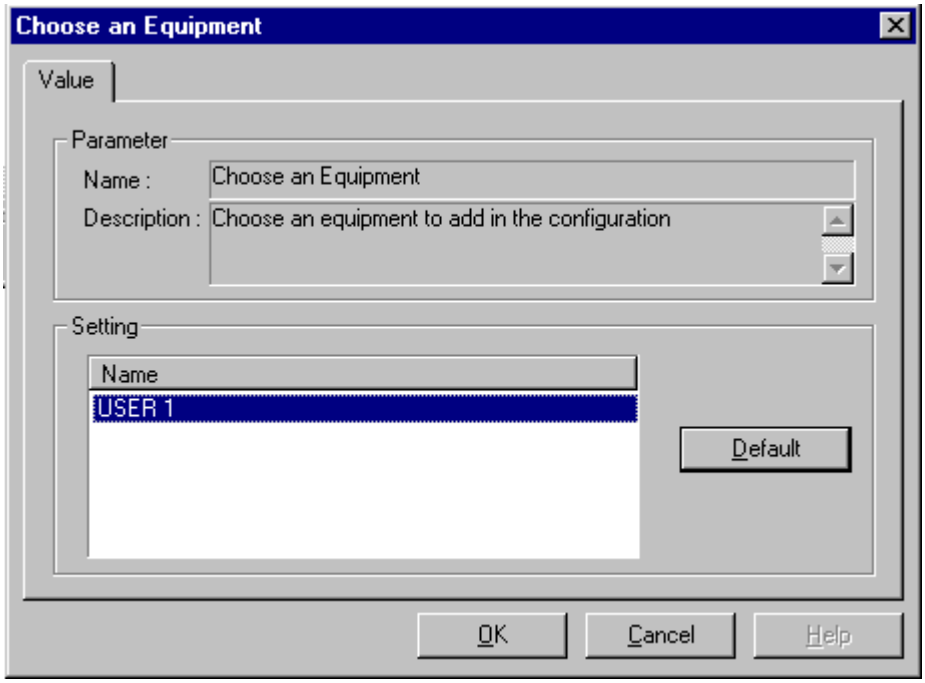
The original configuration should load, select Board 1, Channel 0, **SERVER EQUIPMENT** as shown below.



The Server Equipment Tag is used to identify the external equipment to which we need wish to communicate. To do this: -

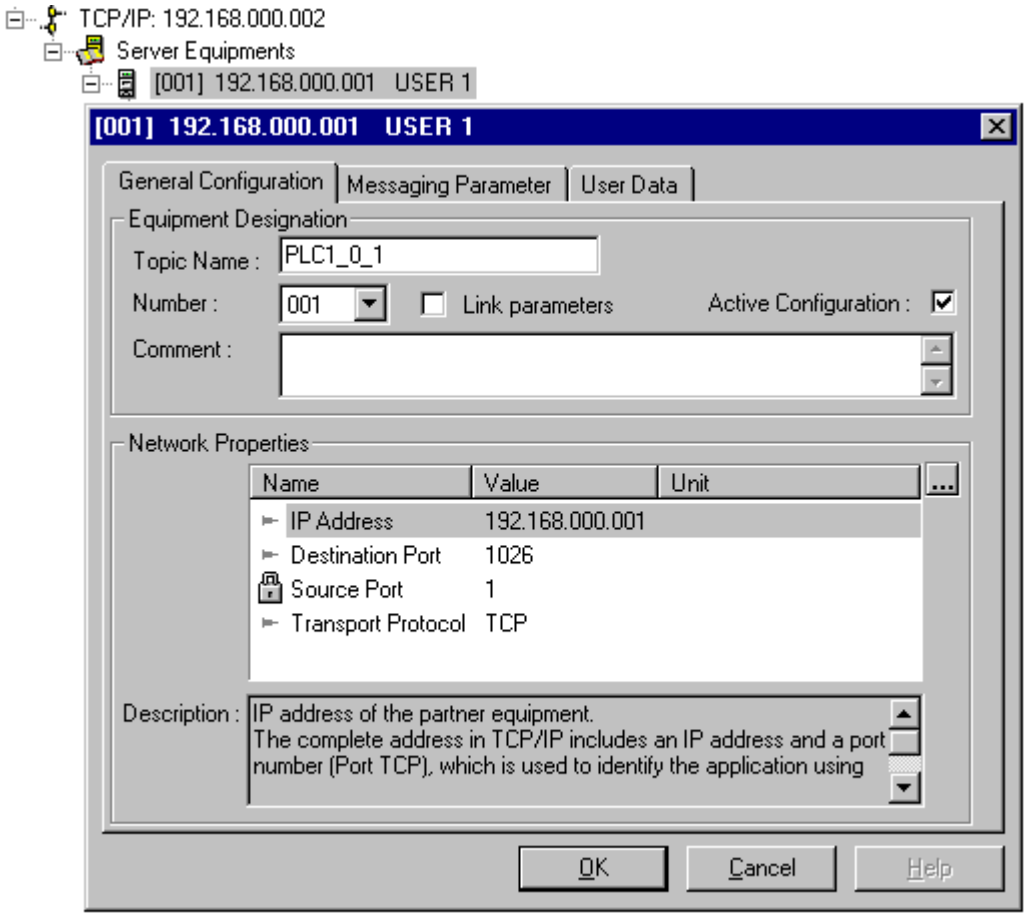
Using the mouse right click Server Equipment then select Insert.

This will open “Choose an Equipment” window.



Select USER1 and **OK** to continue.

This will open the following window allowing the remote device IP Address to be configured (what you want to talk with) e.g. GEM80 500 or GEMLAN-T.



Under General Configuration Tag

1. Change the Transport Protocol from UDP to TCP.

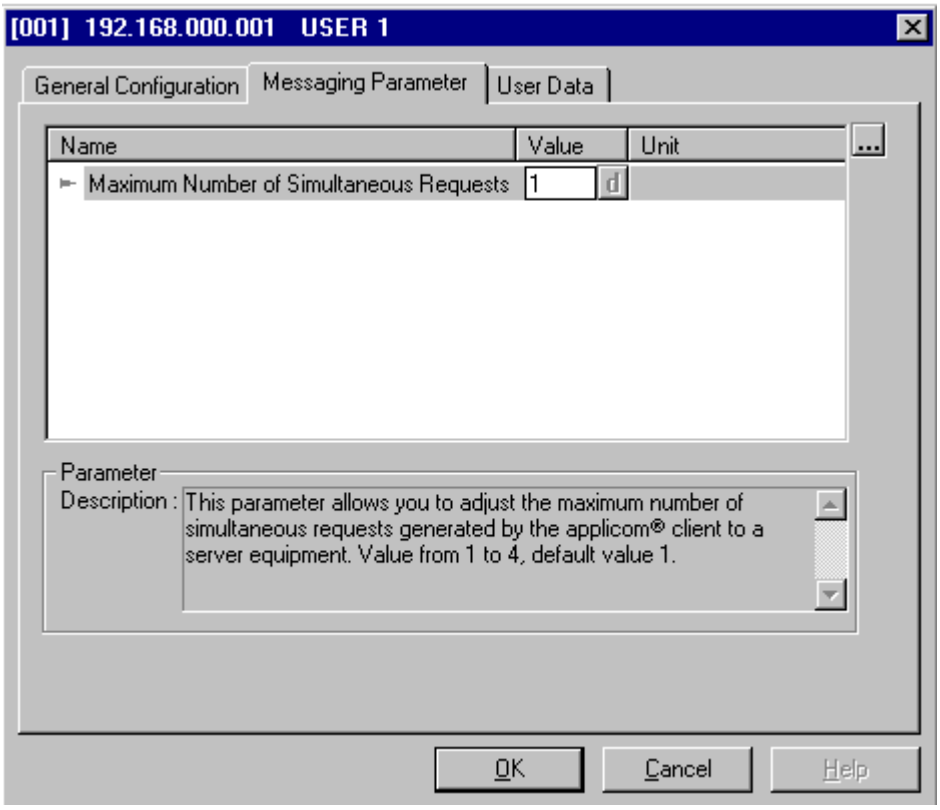
2. Remove the link parameter tick.

3. **The IP Address** needs to be set as per the external equipment address, i.e. as per P-Tables in GEM80.

4. **The Destination Port** set as per the little endian connection number specified in the GEM80.

5. **Topic Name** can be changed to reflect the external device. Note that this name is used later for OPC connection into the SCADA.

Messaging Parameters Tag



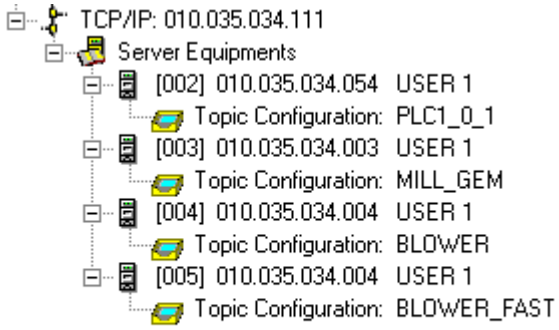
The GEM80 500 & GEMLAN-T can handle up to 25 simultaneous channel connections, each capable of handling 110 data tables. If the 110-table limit is exceeded on any one channel the data on that channel will be "multiplexed" through until the update is complete.
If you require more than 110 tables it is better to split the required amount over 2 or more channels, thus improving the through put.

This can be achieved using the Messaging Parameter Tag. This parameter allows you to adjust the maximum number of simultaneous channels generated by the applicom® client to the server equipment that can be opened by a topic. Value allowed are 1 to 4, default value 1channel.

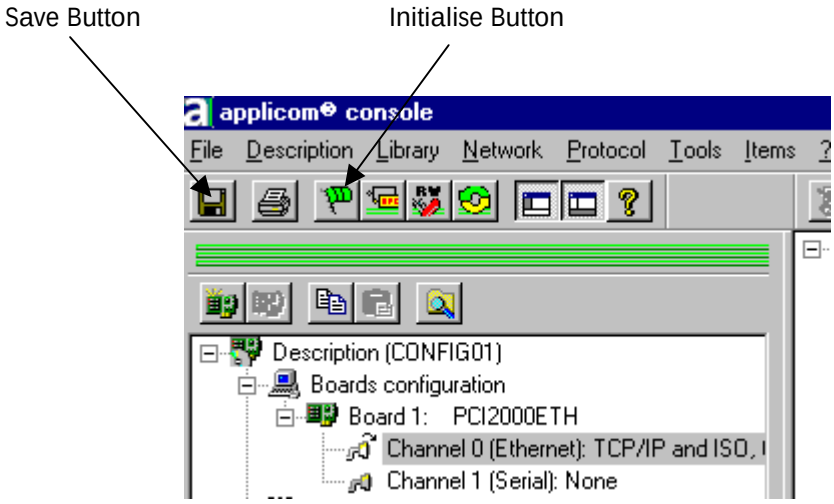
The opening of the 4 channels is automatic, the user will not know how many are open at any one time. Initially only one channel will be opened, but if the 110 "window" is exceeded a second channel will be opened and so on, up to the limit set by the user (1 to 4).

It is possible that you require more data per PLC scan than these 4 channels can handle without multiplexing the data through. In this instance you can configure another server connection to the same equipment, gain a maximum of 4 channels per connection to be open for this new topic. If you do this upon saving the applicom® configuration you will get an ERROR message alerting that the same IP address has been used on different connections.
This message can be ignored as the GEM80 500 and GEMLAN-T can handled multiple connections from this card and other devices.

The following shows a typical server equipment connection to three different GEM80 Controllers, the Blower GEM80 having two connections. The “BLOWER_FAST” connection is in fact no faster than the others are, but providing the SCADA requests are limited to a maximum of 4 X 110 tables on this channel, the update rate will be optimised.



At the end of the configuration save the file and run initialise, you can do this from CONSOLE by clicking the buttons shown below.



Applicom® INITALIZE will locate your saved configuration file and run the file on the applicom® PCI1200ETH board, thus starting the communication.
If at any time make any changes in applicom® CONSOLE you will be prompted to save and run applicom® INITALIZE before you exit

You can also run applicom® INITALIZE from the windows start button at any time without first running applicom® CONSOLE. Console is only used to configure the system.

At this stage the system is configured.

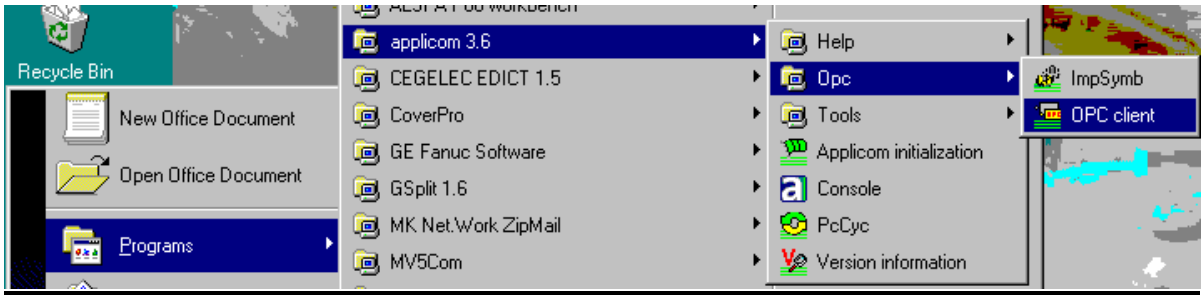
TEST IT - OPC LEVEL TESTS (reading E1 in a GEM80)

Although the configuration of the applicom® board is now complete it is possible to test the OPC link before the SCADA software is launched. This is a useful step as it proves that the applicom® Board and interface are functioning correctly without the added complication of the SCADA software.
The test assume that you have configured the IP and Little Endian connection ports to match the values entered in the GEM80 Controller, and the applicom® PCI1200ETH card has suitable IP, Gateway and Subnet Mask. The PLC and PCI1200ETH are connected on a suitable network.

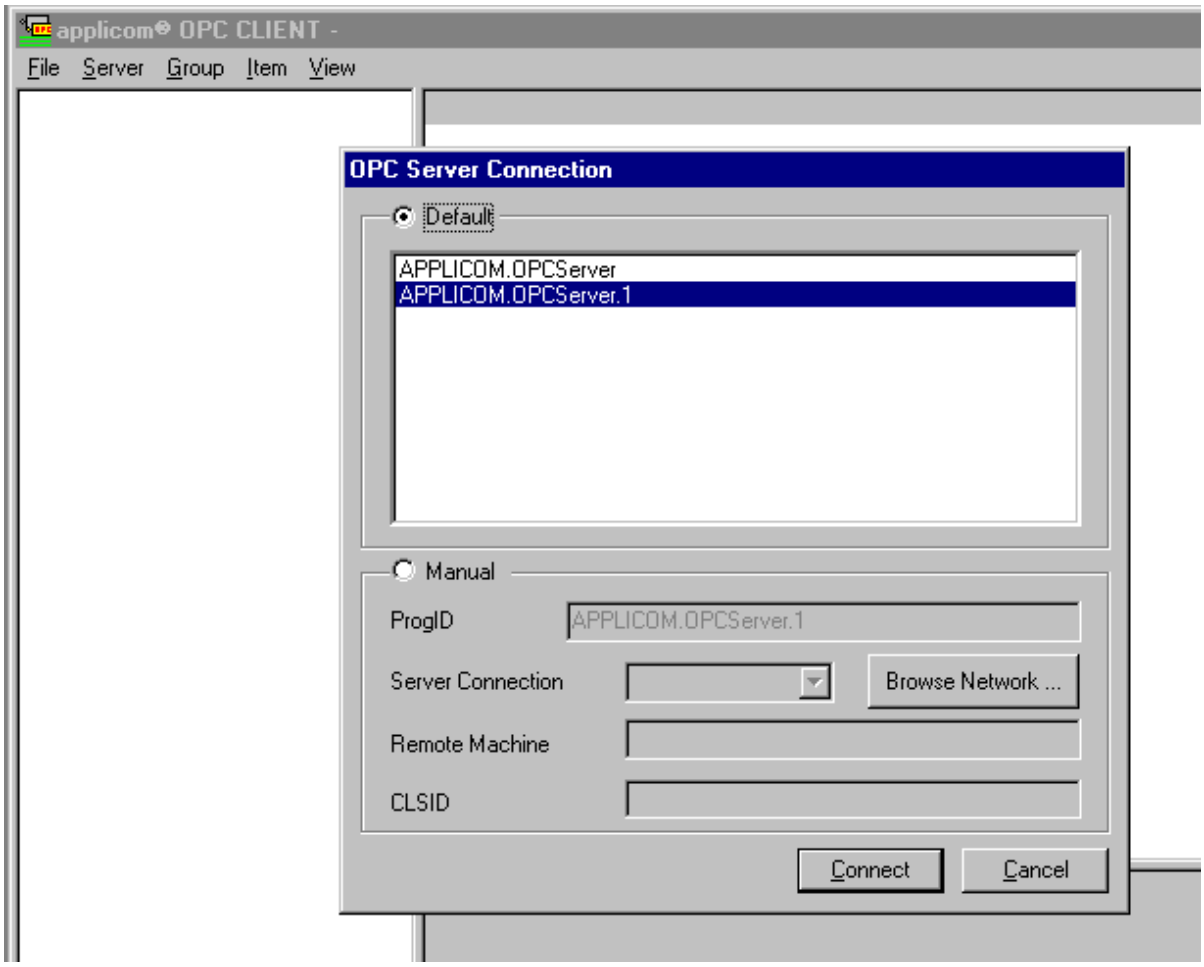
If unsure please refer to the GEMLAN-T Technical manual reference T2011EN.

OPC LEVEL TEST

Shut down applicom® CONSOLE, INITILIZE if not already done and launch APPLICOM OPC CLIENT.

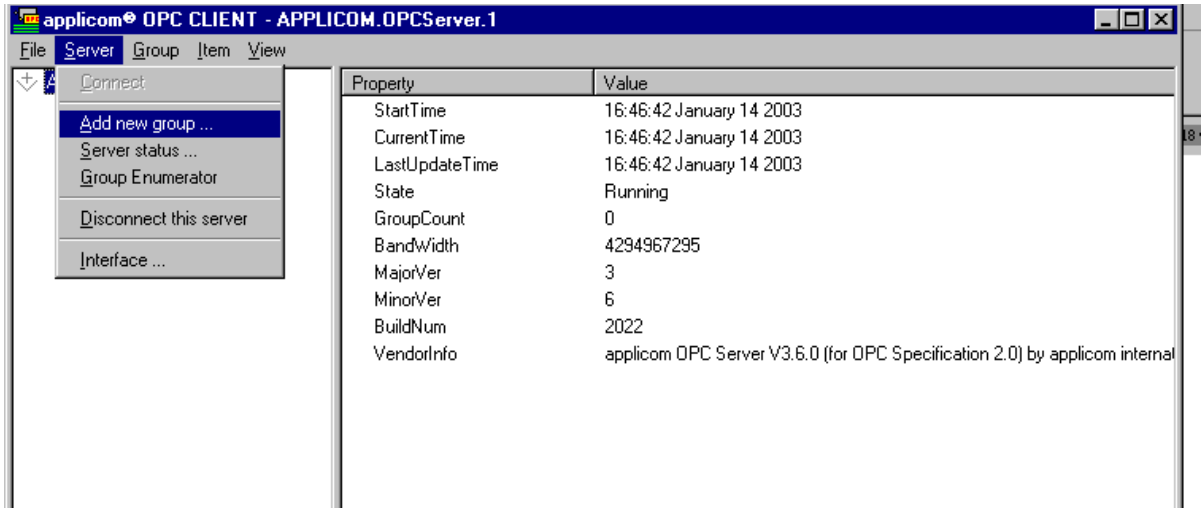


When open select **Server**, **Connect** which should open the connection window shown below.

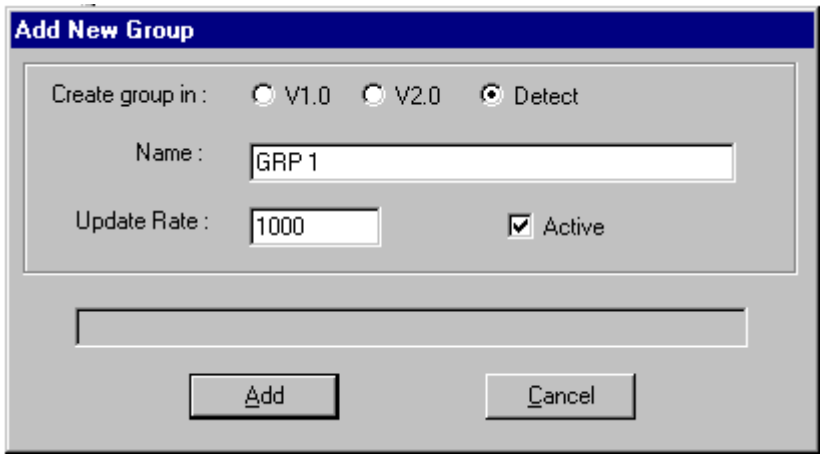


This allows you to select the applicom® connection as shown above.
Continue with **Connect**.

Now add a new GROUP to the connection as follows.

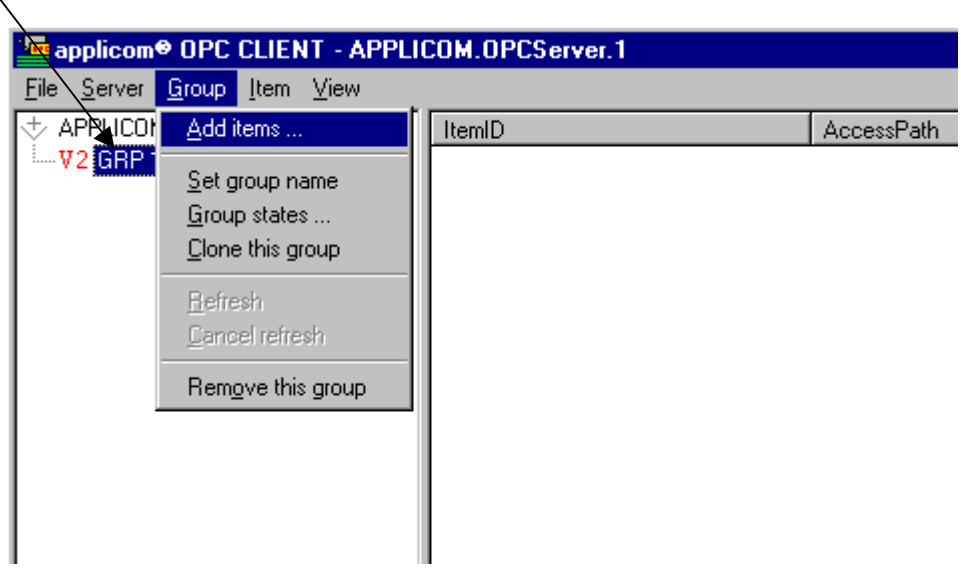


You can use any name for the group you wish, our example uses GRP1.



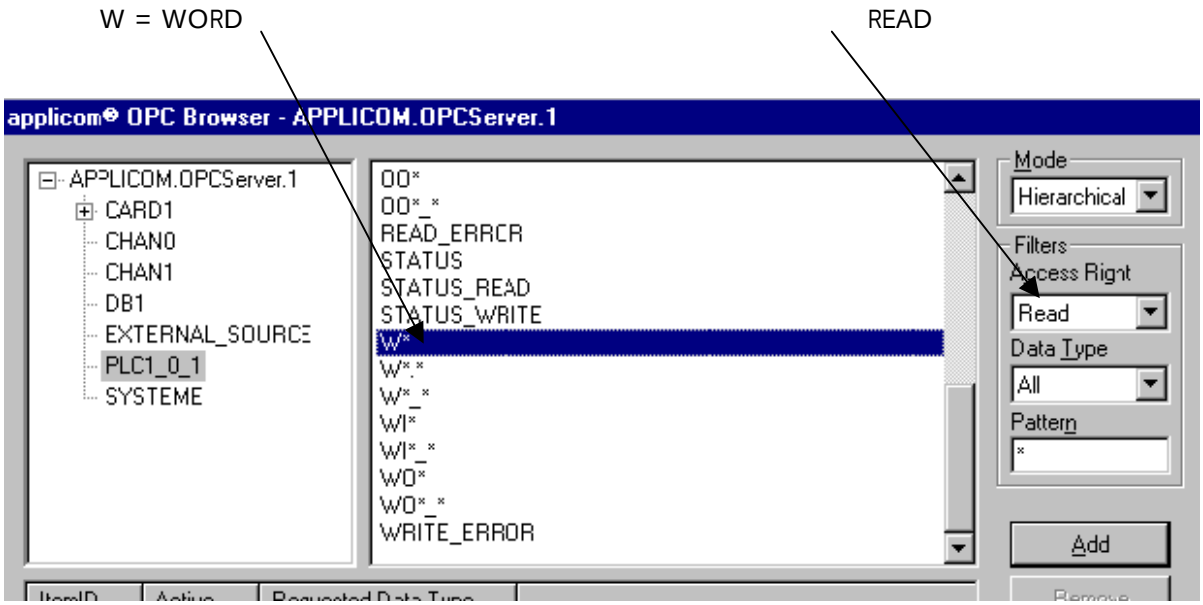
Now add ITEMS to the GROUP, ensure you select the group first.

Select the GRP1

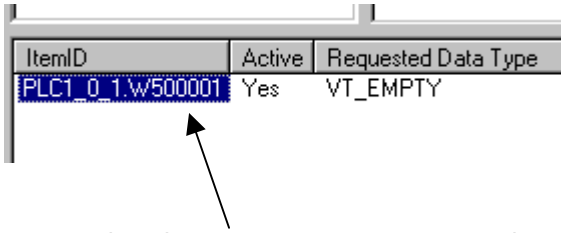


This allows us to select the applicom® Server. PLC_01 is **Topic Name** given during configuration, (PLC_01 our example).

We can then select to read E1 (SECONDS) from the GEM80 PLC_01.



Use **Add** to insert this variable or double click W*.



You need to change W to W500001 to read E1 in the GEM80, details of operation given in the GEMLAN-T APLICOM.DOC. An extract from the document is on page 13 showing the relationship between GEM80 Data Tables and the OPC Reference Address.

Once completed continues with **OK.**

This should then display the seconds obtained from the GEM80 real time Clock table E1.

This completes the test.

Table Description	Mnemonic	OPC / DDE syntax			
		Bit	Word	Float	Double
Inputs	A00000 - 32767	W1xxxxx.y	W1xxxxx	F1xxxxx	D1xxxxx
Outputs	B0000 - 32767	W2xxxxx.y	W2xxxxx	F2xxxxx	D2xxxxx
Fast I/O inputs	C0000 - 32767	W3xxxxx.y	W3xxxxx	F3xxxxx	D3xxxxx
Fast I/O outputs	D0000 - 32767	W4xxxxx.y	W4xxxxx	F4xxxxx	D4xxxxx
Timing flags	E0000 - 32767	W5xxxxx.y	W5xxxxx	F5xxxxx	D5xxxxx
fault flags	F0000 - 32767	W6xxxxx.y	W6xxxxx	F6xxxxx	D6xxxxx
General work space	G0000 - 32767	W7xxxxx.y	W7xxxxx	F7xxxxx	D7xxxxx
General work space	H0000 - 32767	W8xxxxx.y	W8xxxxx	F8xxxxx	D8xxxxx
Serial link control flags	I0000 - 32767	W9xxxxx.y	W9xxxxx	F9xxxxx	D9xxxxx
Serial communication Inputs	J0000 - 32767	W10xxxxx.y	W10xxxxx	F10xxxxx	D10xxxxx
Serial communication Outputs	K0000 - 32767	W11xxxxx.y	W11xxxxx	F11xxxxx	D11xxxxx
Video control tables	L0000 - 32767	W12xxxxx.y	W12xxxxx	F12xxxxx	D12xxxxx
Maintenance table	M0000 - 32767	W13xxxxx.y	W13xxxxx	F13xxxxx	D13xxxxx
STARNET general workspace	N0000 - 32767	W14xxxxx.y	W14xxxxx	F14xxxxx	D14xxxxx
STARNET general workspace	O0000 - 32767	W15xxxxx.y	W15xxxxx	F15xxxxx	D15xxxxx
Pre-set data	P0000 - 32767	W16xxxxx.y	W16xxxxx	F16xxxxx	D16xxxxx
Floating point data	Q0000 - 32767	W17xxxxx.y	W17xxxxx	F17xxxxx	D17xxxxx
General work space	R0000 - 32767	W18xxxxx.y	W18xxxxx	F18xxxxx	D18xxxxx
STARNET general workspace	U0000 - 32767	W21xxxxx.y	W21xxxxx	F21xxxxx	D21xxxxx
Address data table	V0000 - 32767	W22xxxxx.y	W22xxxxx	F22xxxxx	D22xxxxx
General work space	W0000 - 32767	W23xxxxx.y	W23xxxxx	F23xxxxx	D23xxxxx

Remark:

Bit:
Wixxxxx.y
Where
- "i" is the index of the table letter in the alphabet
- "xxxxx" is the word address
- "y" is the offset of the bit in the word (from 0 to 15)

Example R167.5 is W1800167.5

Word
Wixxxxx
Where
- "i" is the index of the table letter in the alphabet
- "xxxxx" is the word address

Example R167 is W1800167

Float/Real
Fixxxxx
Where
- "i" is the index of the table letter in the alphabet
- "xxxxx" is the word address

Example U1235 is W2101235

Double
Dixxxxx
Where
- "i" is the index of the table letter in the alphabet
- "xxxxx" is the word address

Example G55 is W700055