

# Technical Information Sheet

Page 1 of 10

**TIS#: 298**

**Date: June 2, 2009**

**Issued by: Mark Demick**



Subject
How to use the Eurotherm's Chessell 6000 Series Paperless Graphic DAQ Recorders with Wonderware's DASMBTCP Server V1.5.

## Software and Hardware Used

Eurotherm Chessell 6180A, V4.3 Firmware

Wonderware OPCLink V8

Wonderware InTouch V9.5

Wonderware DASMBTCP V1.5 (0246.0186)

Open Wonderware System Management Console; start/All Programs/Wonderware/System Management Console. If DASMBTCP is installed there is an Arcestra.DASMBTCP.1 folder in the DAServer manager hierarchy tree as shown in Figure 1.

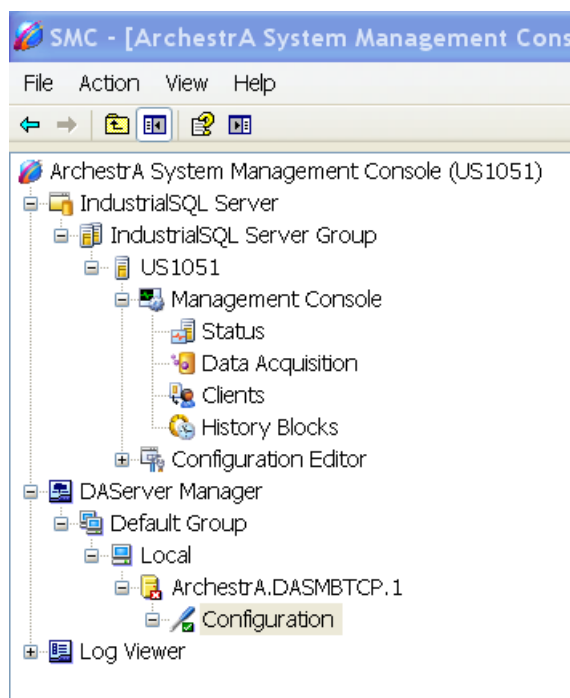


Figure 1 Arcestra Hierarchy

The server specific configuration portion of the MBTCP server starts by adding a TCPIP\_PORT object by right clicking on Configuration and selecting Add TCPIP\_PORT Object. The default port name is New\_TCPIP\_PORT\_000 that can be changed to something more informative. This is shown in Figure 2 where the TCPIP\_PORT has been renamed to TCPIP1.

Leave the Port number default of 502 as is.

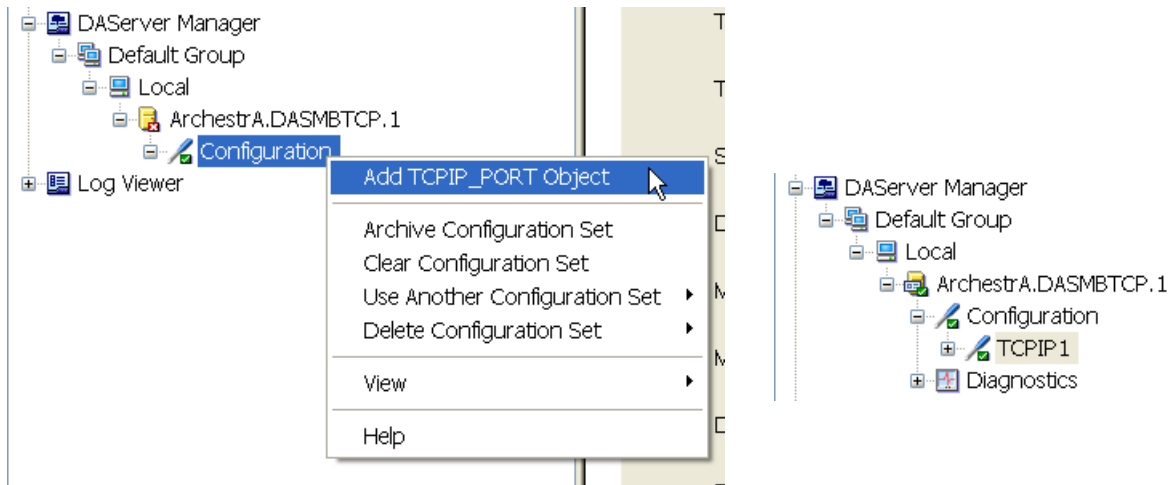


Figure 2 Adding TCPIP\_PORT Object

To complete the configuration endpoint hierarchy add a ModbusPLC object to the TCPIP\_PORT object. There are other Modbus controller objects that can be created at this hierarchical level, however, the ModbusPLC object represents the generic 4, 5 or 6-digit controller to which the Eurotherm recorders and controllers are compatible. For the 6000 Series recorder, the addressing is 6-digit.

Add a ModbusPLC object as shown in Figure 3 for each recorder on the network that has a unique IP Address. The default name is New\_ModbusPLC\_000 and may be changed to something more informative.

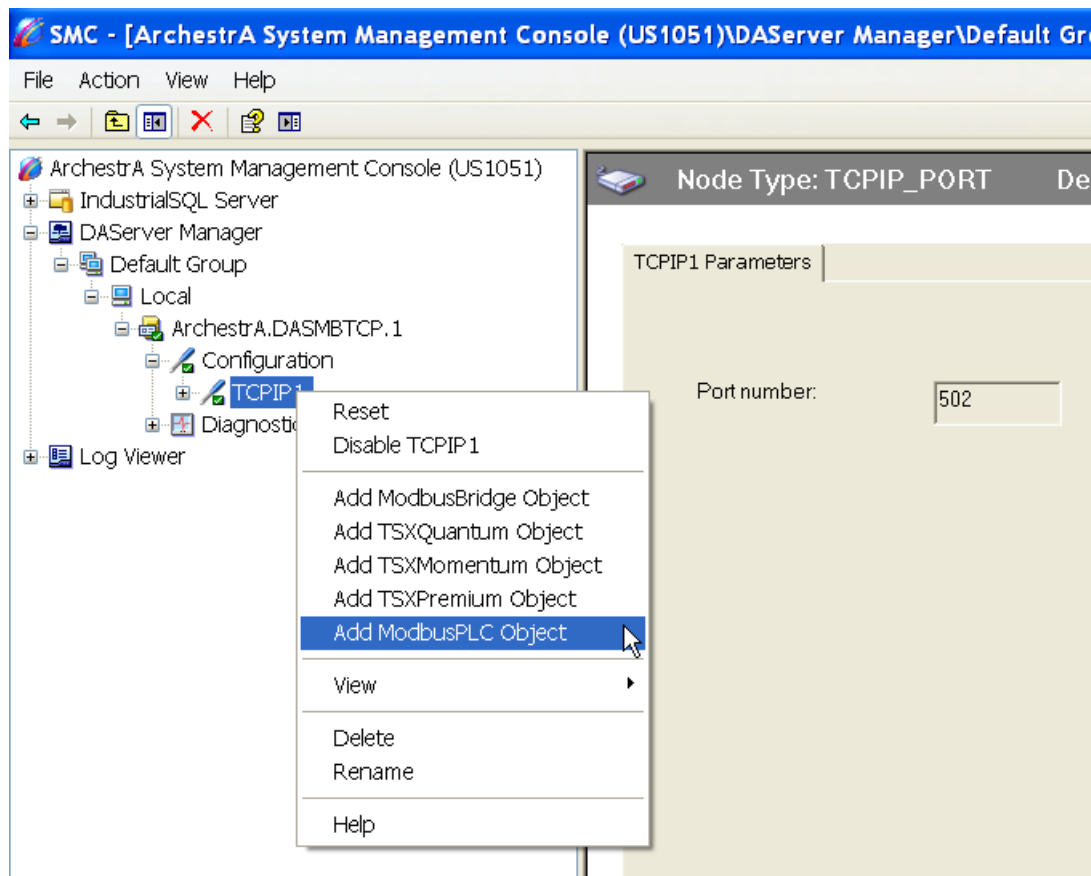


Figure 3 Adding a ModbusPLC Object

For the ModbusPLC object named F12\_Chessell, the configuration shown in Figure 4, are the defaults except for the Network address that has been changed to that of the connected Chessell 6180A recorder and unchecking 'Use Concept data structures (Reals) that is explained further on.

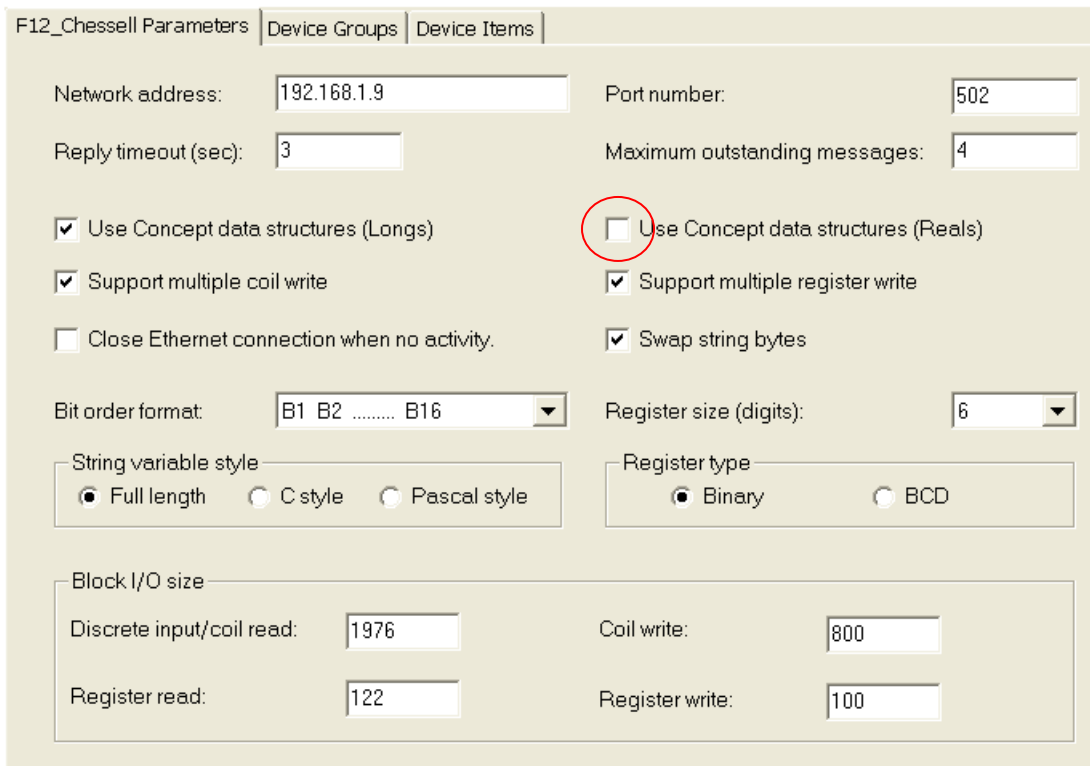


Figure 4 Modbus PLC Object Parameters

To add a Device Group, select the Device Groups tab, right click anywhere in the cell areas and select Add as shown in Figure 5. Change the default Name from Topic\_0 to a more meaningful name if desired.

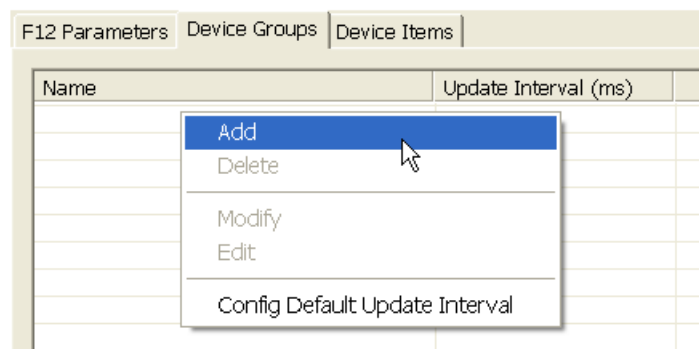


Figure 5 Modbus PLC Device Group Parameters

In the Device Items tab, item names and modbus addresses are entered. There are available integer and real (32-bit single precision) having defined **absolute** modbus addresses rather than register-number addressing for configuration and run-time data in the recorder. To determine the modbus address for the Device Items tab reference the 6100A/6180A User Guide, HA028910, Issue 6, available from the Eurotherm web sites. In the 6100A/6180A User Guide section 8 are the Modbus TCP Slave Comms address information.

The integer channel run-time addresses are from section 8.4.3, Channel Run-Time data, while real channel run-time addresses are from section 8.4.8, IEEE Area Channel run-time data. Using Channel 1 as an example from the

table, 'Ch1 value' is listed with a modbus address of 41433. This is an absolute address and **not** the modbus address to be entered as the Item Reference in register-number format. The DASMBTCP server supports absolute notation item names through a suffix after the modbus address and register-number addressing.

To convert from absolute to register-number addressing use the following formula:

$$\text{Register-number} = 400000 + \text{absolute address} + 1$$

Using the Ch1 value of 41433 and entering into the formula above we derive the register-number address of 441434 for Ch1.

To add Device Items select the Device Items tab, right click anywhere in the cell areas and select Add. Enter in a name for the device item or tag. Then double click in the corresponding Item Reference cell to add the Modbus register-number address as shown in Figure 6. The Item Reference values can be in either register-number format as shown in Figure 6, or absolute address format as shown in Figure 7.

F12_Chessell Parameters	
Device Groups	
Device Items	
Name	Item Reference
Channel_1_PV_I	441434
Channel_2_PV_I	441437

Figure 6 Modbus PLC Device Items Parameters, Register-Number Addressing, Integers

The Item Reference absolute address is straight from the 6100A/6180A User Guide with a suffix of HR (Holding Register). As the recorder does not distinguish between input or holding registers, the IR (Input Register) suffix may also be used.

F12_Chessell Parameters	
Device Groups	
Device Items	
Name	Item Reference
Channel_1_PV_I	41433 HR
Channel_2_PV_I	41436 HR

Figure 7 Modbus PLC Device Items Parameters, Absolute Addressing, Integers

The above were examples of reading integer values from the recorder. To read real values from the recorder reference section 8.4.8, IEEE Area Channel run-time data, for the absolute Modbus address for the channel process values (PV). The real values consist of two (2) consecutive register values and the word order if not correct can cause the value to read or write incorrectly. From Figure 4, note that the 'Use Concept data structure (Reals)' has been unchecked. This changes the word order so that it is interpreted correctly.

Again, either absolute or register-number addressing is supported. Figure 8 shows register-number addressing. Note the suffix 'F' to indicate that this is a real value telling the DASMBTCP driver to read two (2) words. The formula for converting real addresses to integer addresses is the same. The Ch1 real process value address is 63683. Using the same formula as for integers previously results in the Modbus register-number address of

463684. Using absolute addressing requires either the suffix HRF or IRF that is a concatenation of Holding or Input Register with Float.

F12_Chessell Parameters		Device Groups	Device Items
Name	Item Reference		
Channel_1_PV_R	463684 F		
Channel_2_PV_R	463688 F		

Figure 8 Modbus PLC Device Items Parameters, Register-Number Addressing, Integers

F12_Chessell Parameters		Device Groups	Device Items
Name	Item Reference		
Channel_1_PV_R	63683 HRF		
Channel_2_PV_R	63687 HRF		

Figure 9 Modbus PLC Device Items Parameters, Absolute Addressing, Integers

When reading integer values from the recorder, there is a parameter in the recorders Channel configuration that effects the position of the implicit decimal point. This is set by the 'Max Decimal Digits' parameter in a Channel's Configuration. Only if the resulting value can be represented within 16 bit resolution ( $\pm 32767$ ), will the value be transmitted accurately.

For example, with a Max Decimal Digits of 4 and a value of 12.3456, the integer value would be 123456 that needs more than 16-bit resolution, and the transmitted value would be the maximum value of 32767 (over range). Reducing the Max Decimal Digits number of decimal places to three (3) using our example number 12.3456, results in an integer value of 12345 which allows the value to be encoded as a 16-bit value which can be transmitted accurately.

It can be seen then that the Max Decimal Digits parameter is a multiplier on the channel value that causes an implicit decimal point position in the Modbus values. For reads from the recorder, this implies that at the host device that the value needs to be divided by  $10^n$  where  $n$  is Max Decimal Digits.



Archive	Save/Restore	Config	Security	Network	System
Channel Number		2) Channel 2 ▼			
Value		7.7 Unadjusted			
Input Type		Modbus Comms Input ▼			
Scale Low		0 °F			
Scale High		1000 °F			
Units		°F			
Scale Type		Linear ▼			
Scale Divisions - Major		10			
Scale Divisions - Minor		1			
Descriptor		Channel 2			
A/B Switching		<input type="checkbox"/>			
Zone Low		0 %			
Zone High		100 %			
Pv Format		Numeric ▼			
Max Decimal Digits		1			
Colour		Blue			
Alarm Number		1 ▼			
Enable		Off ▼			
Job Number		1 ▼			
Category		No Action ▼			

Figure 10 Max Decimal Digits.

The DASMBTCP Server is an OPC Server. This means that any OPC Client can connect to the DASMBTCP Server. In Figure 11, the Eurotherm iTools OPC Scope client has been used to demonstrate an OPC Client connecting to the DASMBTCP Server.

Two (2) items configured previously are shown receiving values in OPC Scope.

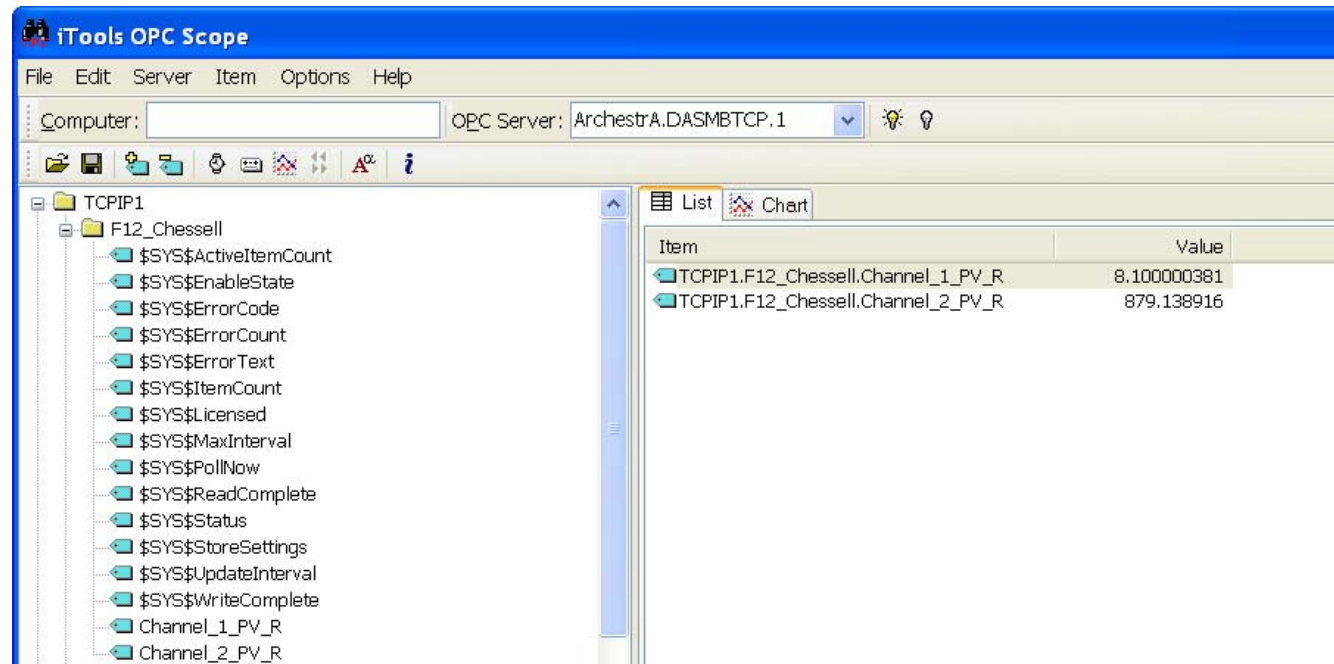


Figure 11 iTools OPC Scope

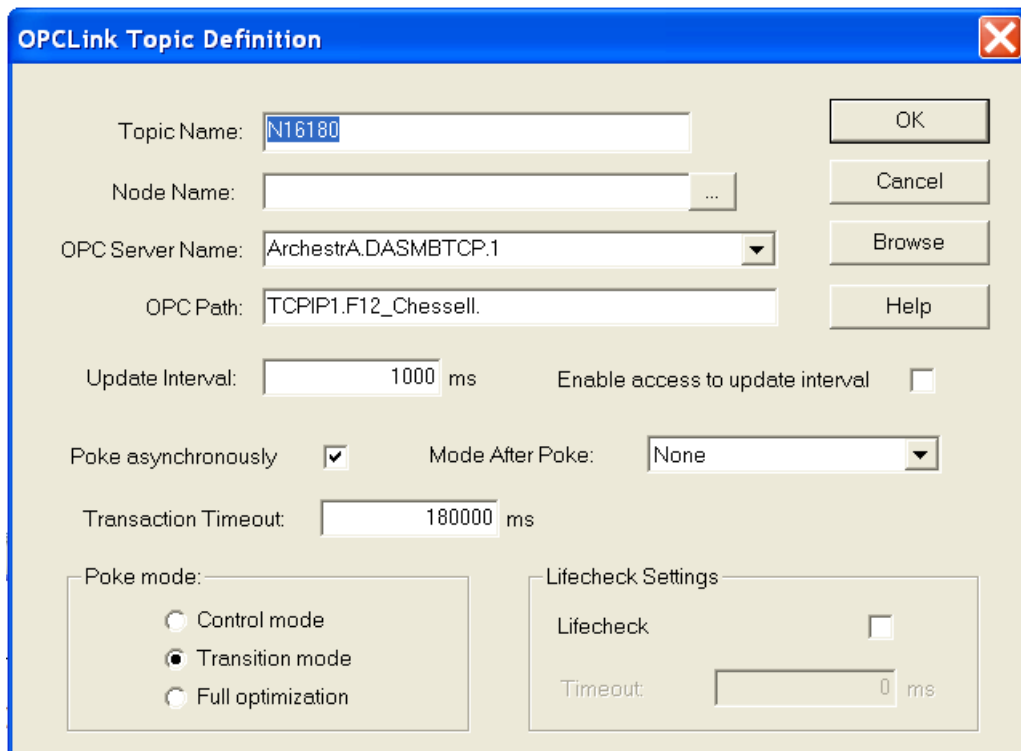
To use the DASMBTCP Server with InTouch, the Wonderware OPCLink Client needs to be configured to interface between InTouch and the DASMBTCP Server. This is because InTouch is not an OPC Client.

Open OPCLink, create a New Configuration if required and configure one or more Topic Definitions.

As shown in Figure 12, the Topic Name can be anything but typically descriptive of the instrument node, the OPC Server Name chosen from the drop-down and the OPC Path configured by clicking on the Browse button.

This brings up the OPC Browser window as shown in Figure 13. You can see the TCPIP\_Port and Modbus\_PLC Objects defined in DASMBTCP Server. The OPC Path configured below includes both of those object names though it does not have to; e.g. the OPC Path could be TCPIP\_PORT object name only. In any case, the remainder of the OPC Path name is entered during the definition of the tag in WindowMaker.





**OPCLink Topic Definition**

Topic Name:

Node Name:

OPC Server Name:

OPC Path:

Update Interval:  ms    Enable access to update interval ☐

Poke asynchronously ☒    Mode After Poke:

Transaction Timeout:  ms

Poke mode:

- ☐ Control mode
- ☒ Transition mode
- ☐ Full optimization

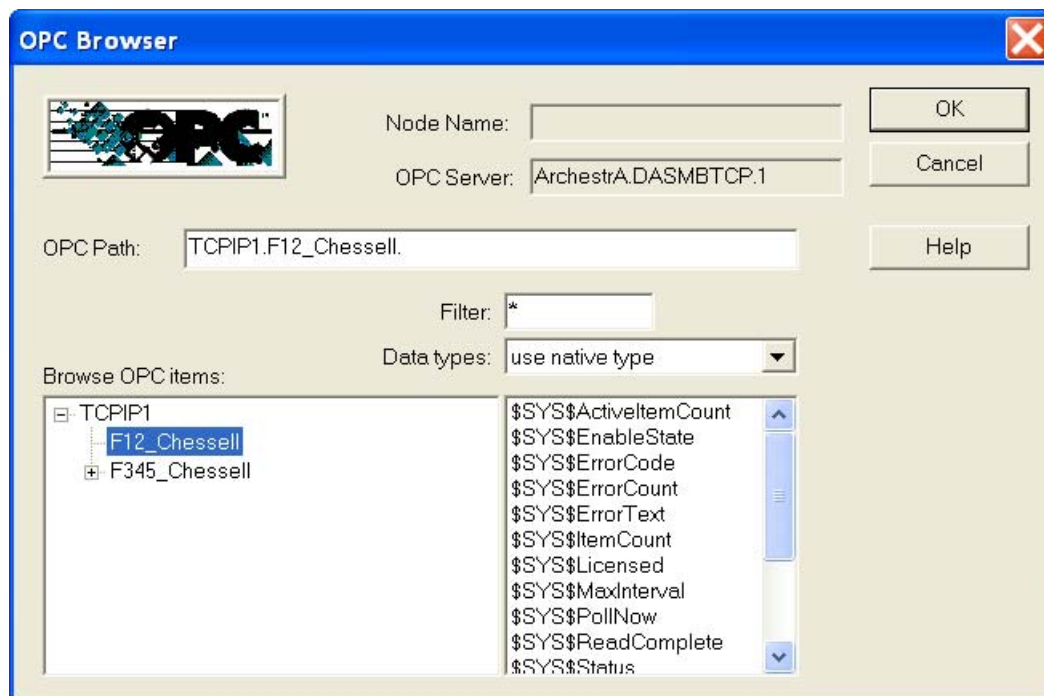
Lifecycle Settings

Lifecycle ☐

Timeout:  ms

OK Cancel Browse Help

Figure 12 OPCLink OPC Topic Definition Dialog Box



**OPC Browser**

Node Name:

OPC Server:

OPC Path:

Filter:

Data types:

Browse OPC items:

- TCPIP1
  - F12\_Chessell
  - F345\_Chessell

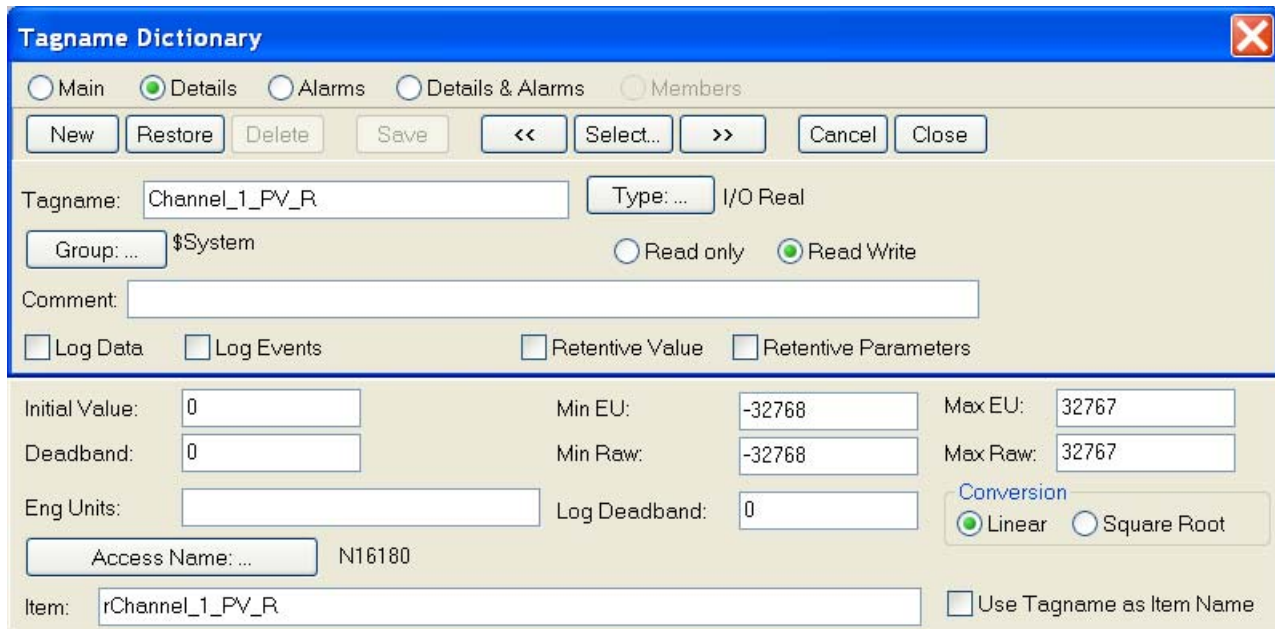
\$SYS\$ActiveItemCount  
 \$SYS\$EnableState  
 \$SYS\$ErrorCode  
 \$SYS\$ErrorCount  
 \$SYS\$ErrorText  
 \$SYS\$ItemCount  
 \$SYS\$Licensed  
 \$SYS\$MaxInterval  
 \$SYS\$PollNow  
 \$SYS\$ReadComplete  
 \$SYS\$Status

OK Cancel Help

Figure 13 OPCLink OPC Browser Dialog Box

A tag in WondowMaker is created as shown in Figure 14. An Access Name has been created to point to the topic created in OPCLink and the tag name is the remainder of the fully qualified OPC path name. The 'r' prefix indicates

a real data type. Thus to concatenate the OPC Path from the topic in OPC Link and the tagname Item below you would have the fully qualified name 'TCPIP1.F12\_Chessell.Channel\_1\_PV\_R'.



The image shows the 'Tagname Dictionary' dialog box with the 'Details' tab selected. The 'Tagname' field contains 'Channel\_1\_PV\_R' and the 'Type' is set to 'I/O Real'. The 'Group' is '\$System' and the 'Access' is 'Read Write'. The 'Comment' field is empty. There are checkboxes for 'Log Data', 'Log Events', 'Retentive Value', and 'Retentive Parameters', all of which are currently unchecked. The 'Initial Value' is 0, 'Min EU' is -32768, 'Max EU' is 32767, 'Deadband' is 0, 'Min Raw' is -32768, 'Max Raw' is 32767, 'Eng Units' is empty, and 'Log Deadband' is 0. The 'Conversion' is set to 'Linear'. The 'Access Name' is 'N16180'. The 'Item' is 'rChannel\_1\_PV\_R'. There is a checkbox for 'Use Tagname as Item Name' which is unchecked.

Figure 14 Tagname Dictionary Tag Definition

On the Wonderware support web site is Tech Note 424, "Working with DAServers", that contains more detailed information than the online help does.

The examples shown within this document apply to more than just the 6000 Series recorders. They apply to any Eurotherm modbus/TCP slave recorder or controller.