



OPC is a software standard that works with the Windows operating systems locally and networked to allow information to flow between many different OPC servers and OPC clients. Several vendors make OPC servers that can be configured to issue the Modbus commands for our MFT line of flow meters. This data can be used by any OPC client program like, Excel, Wonderware, Lookout, Fix32 etc. This separation of the instrument driver from the client program (HMI) increases the software efficiency of both because one can be upgraded or changed without regard for the other and has been a big help over the recent years since OPC was started.

OPC stands for OLE for Process Control and is based on Microsoft's COM/DCOM (component and distributed component technology) technology along with Active X. The COM package was an outgrowth of DDE (dynamic data exchange) and OLE (object linking and embedding). In the late 1990's, the OPC foundation was started, <http://www.opcfoundation.org>. The OPC foundation is also

working on support for XML (super set of HTML for tagging data in a web page) to bring it into compliance with the .NET initiative. They are also working on another project known as OPC DX which will allow different network protocols to communicate with each other. Therefore a Foundation Fieldbus (FF) network device could work with an Device Net instrument and Modbus instrument with device to device communications. There are also third party OPC watch dog groups like the <http://www.opcconnect.com/> that have lots of leads for this powerful and cost effective technology.

So the basic idea of OPC is that many different Client programs are available to read/write data to many different industrial devices and the HMI and SCADA programs can work with all of them, Modbus, Modbus TCP, Device Net, FF, Profibus, Control Net just to name a few.

## **OPC Servers for Modbus and Modbus TCP**

The original Open Modbus specifications were developed by Modicon in the late 1970's and in the late 1990's they revised it for use with TCP/IP known as Open Modbus or Modbus TCP. The TCP/IP version runs on Ethernet generally and there are gateways between the RS-485 versions of Modbus (RTU, ASCII) and the TCP/IP version (ie. Sixnet makes a device which does just that, their model ET-GT-485). There are third party software packages that do Modbus TCP and/or Modbus RS-485 and provide the OPC server function. Several companies that market Modbus OPC Servers are:

KEPware Products, Automated Solutions, Schneider Automation, Merz, Iconics, National Instruments, Softing, Trebing and Himstedt, etc. (see above websites for more comprehensive and up to date list)

These packages are general purpose and must be configured to operate the specific Modbus device of interest. Some are run-time configured, some are configured then compiled into stand-alone code like National Instruments "LabView", Iconics "OPC ToolWorX" product and Softing's "XPress OPC Server Tool". These use Microsoft Visual C++ and have wizards to generate the source code.

Some of the easiest to use are pre-canned packages like that from KEPware Products or Automated Solutions. Their servers can do many channels and tags but only capture one tag per transaction. The custom programs can read many registers at the same time, like flow and temperature from the Kurz MFT line with one data packet from the Modbus master doubling or more throughput

A contemporary and comprehensive reference book is "OPC FUNDAMENTALS, IMPLEMENTATION, AND APPLICATION" by Frank Iwanitz and Jurgen Lange. 2002 Huthig Verlag Heidelberg. This can be ordered from the OPC Foundation website.