

# OPC

## What is OPC?

OPC is the interoperability standard for the secure and reliable exchange of data in the industrial automation space. It is platform independent and ensures the seamless flow of information among devices from multiple vendors. The OPC Foundation is responsible for the development and maintenance of this standard.

The OPC standard is a series of specifications developed by industry vendors, end-users and software developers. These specifications define the interface between Clients and Servers, as well as Servers and Servers, including access to real-time data, monitoring of alarms and events, access to historical data and other applications.

When the standard was first released in 1996, its purpose was to abstract PLC specific protocols (such as Modbus, Profibus, etc.) into a standardized interface allowing HMI/SCADA systems to interface with a “middle-man” who would convert generic-OPC read/write requests into device-specific requests and vice-versa. As a result, an entire cottage industry of products emerged allowing end-users to implement systems using best-of-breed products all seamlessly interacting via OPC.

Initially, the OPC standard was restricted to the Windows operating system. As such, the acronym OPC was borne from OLE (object linking and embedding) for Process Control. These specifications, which are now known as [OPC Classic](#), have enjoyed widespread adoption across multiple industries, including manufacturing, building automation, oil and gas, renewable energy and utilities, among others.

With the introduction of service-oriented architectures in manufacturing systems came new challenges in security and data modeling. The OPC Foundation developed the [OPC UA](#) specifications to address these needs and at the same time provided a feature-rich technology open-platform architecture that was future-proof, scalable and extensible.

Today the acronym OPC stands for Open Platform Communications.

These are just some of the reasons why so many members and other technology organizations (collaborations) are turning to OPC UA for their interoperability platform.

Commercial OPC Servers products:

- PTC's - Kepware
- Rockwell Automation's – RSLinx Classic

## OPC within PlantWatch Overview

To gather information from an OPC device, you create Variables and select them to be OPC type Variables. This causes the Variable to be continuously updated with the value from the remote OPC device.

To send information to an OPC device you configure a Logic Chart cell as a WriteToOPC type. This allows you to send data such as constants or variables to the remote OPC device.

To configure reading or writing data to an OPC devices, we will create two organizational structures:

OPC Servers

OPC Groups

At a high level, OPC is comprised of several objects: the “Server”, the “Group”, and the “Item”. The OPC Server object maintains information about the server and serves as a container for OPC Group objects. The OPC group object maintains information about itself and provides the mechanism for containing and logically organizing OPC Items.

The OPC Groups provide a way for clients to organize data. For example, the group might represent items in a particular station. The rate that an OPC Server provides the data changes to PlantWatch (PW) is configurable as the group refresh period.

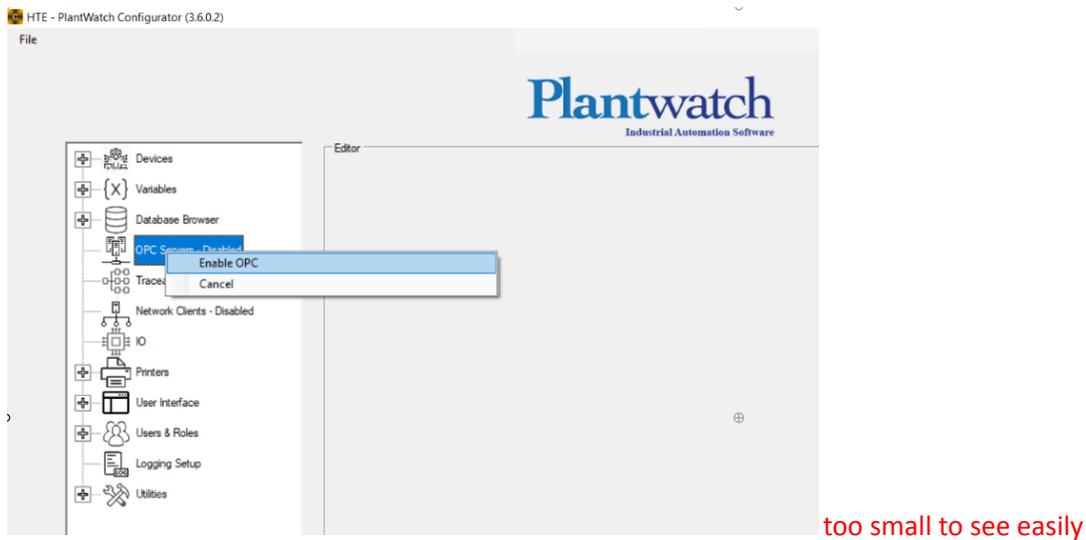
Each time that PW is configured to send data to an OPC device, a Server is selected from an existing list and then the specific item address is entered. **The the** OPC Item value is communicated the next time the logic cell is executed.

## Servers and Groups

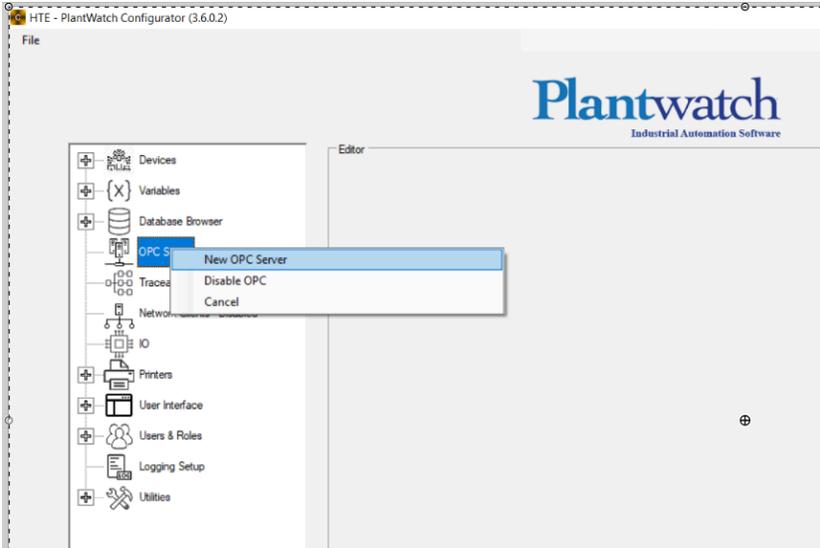
### Configuring OPC Servers

When configuring PW for communication over OPC, the first thing to do is to enable OPC and create a connection to the OPC Server that you want to communicate with. This is done with the OPC Servers configuration.

Right click on OPC Servers in the PW Tree View and select *Enable OPC* menu option.



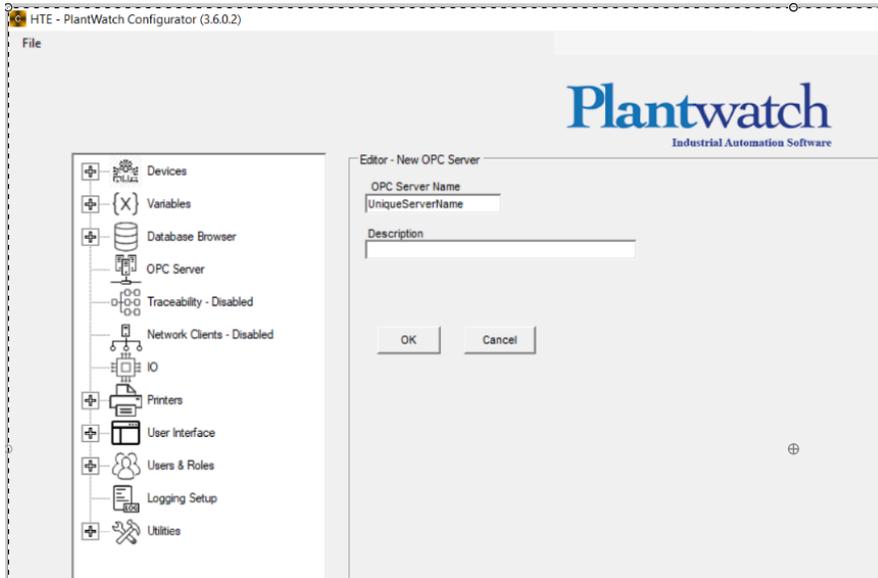
Right click on OPC Servers in the PW Tree View and select *New OPC Server* menu option.



Then enter the formal name of the OPC Server, as specified by the manufacturer in the **OPC Server Name** field..

maybe change the font type or something when specifying a field name (OPC server Name)

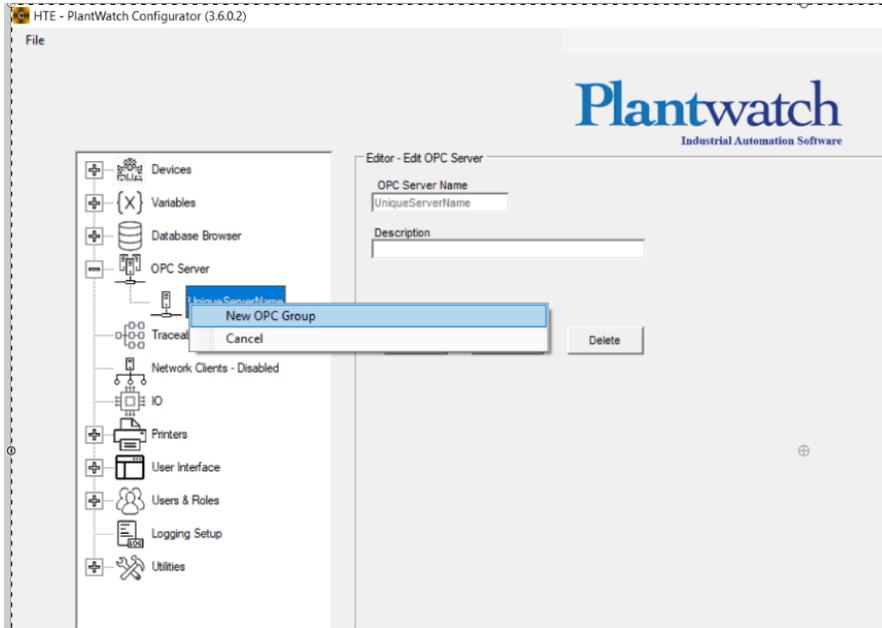
Keeware = “keeware.KEPserversEX.V6”, RSLinx = “RSLinx OPC Server”



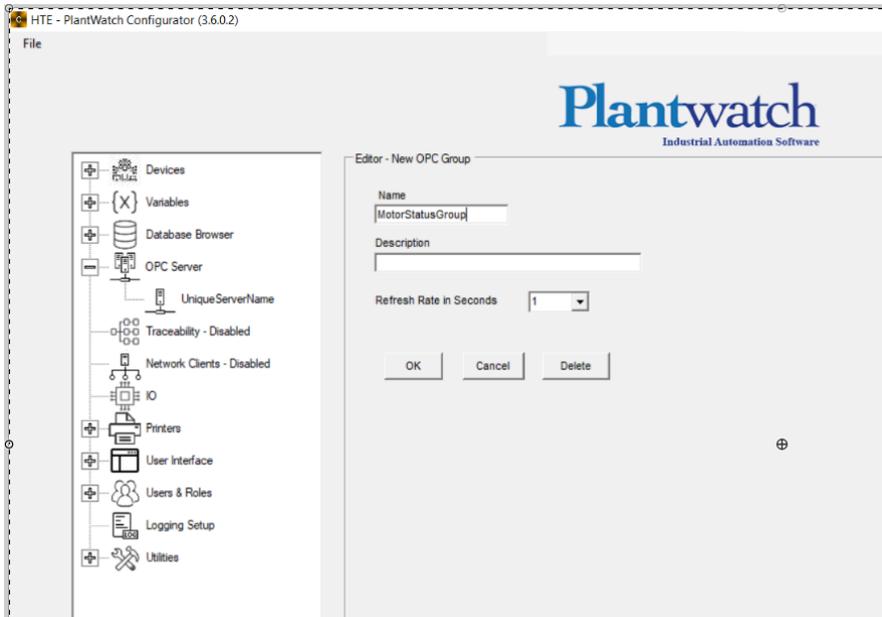
Note that you must use this new OPC Server in a group or it will not be created.

### Create a Group for the OPC Server

Now that you have a reference to the OPC Server, you will create groups that have an associated refresh rate. To create a new Group right click on the OPC Server you want to create a group for and select *New OPC Group* menu option.



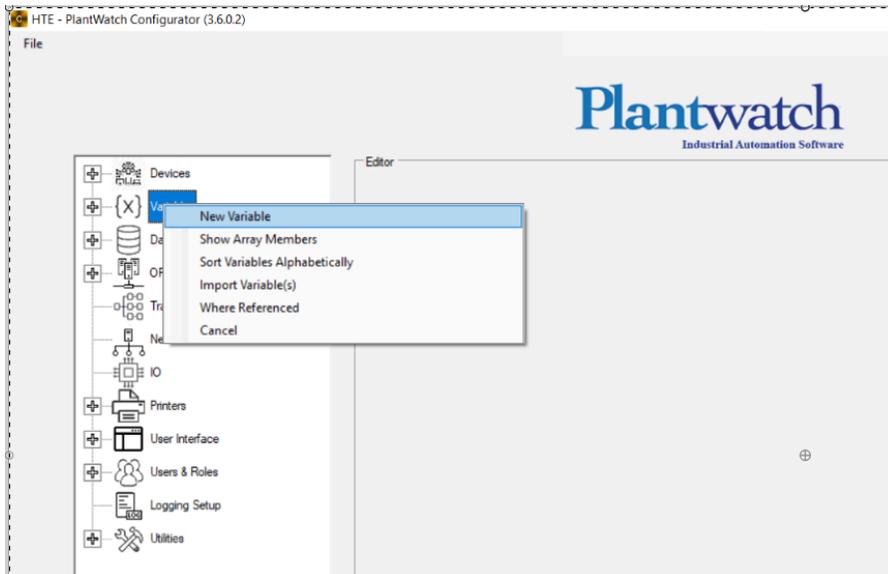
Then enter the formal name of the OPC Group. Select the desired refresh rate for the group from the pull-down list.



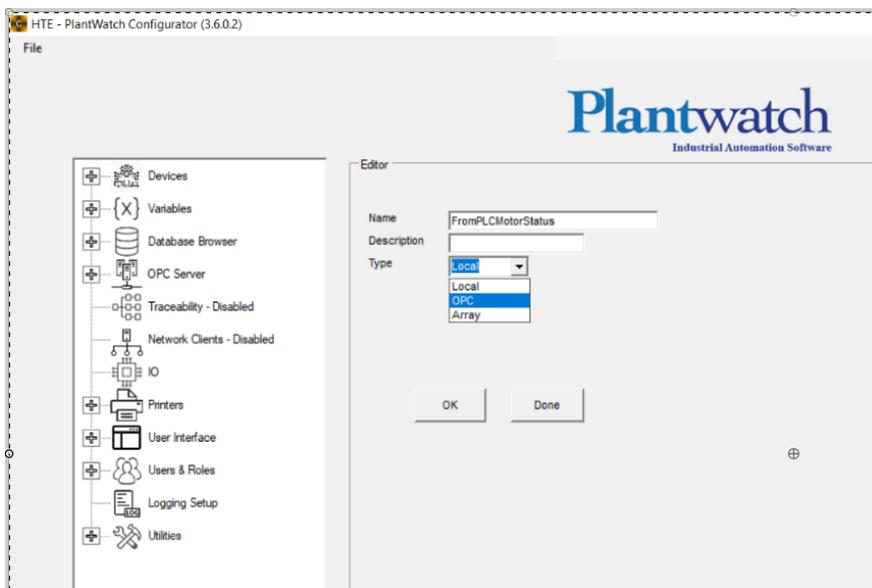
## Getting OPC Data into PW.

## Configuring OPC Servers

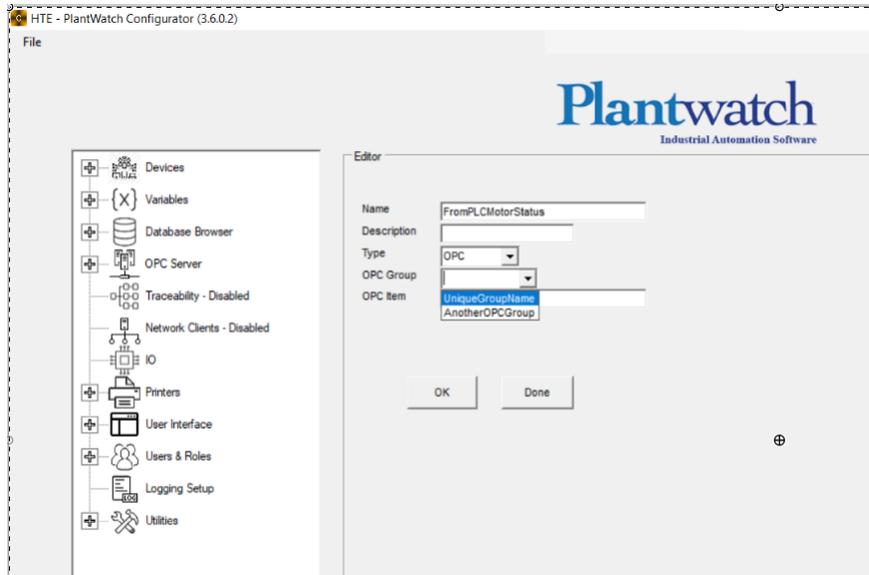
To get information from an OPC device into PW, you create a “Variable” of “OPC type”.



To create a new variable, right click on “Variables” in the PW Tree View and select the *New Variable* menu option.

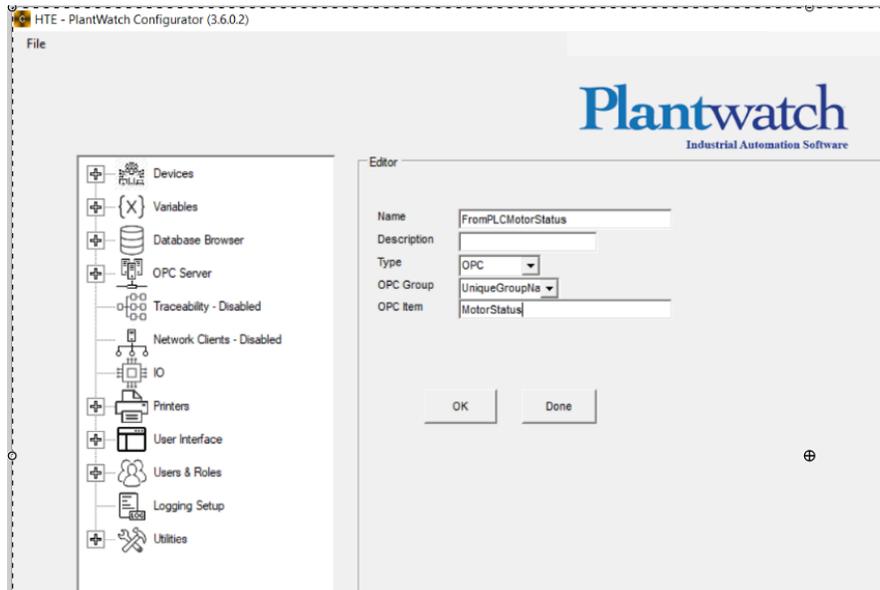


The *New Variable* dialog will be displayed allowing you to enter in the Name, Type and Description of a new variable. By default, the *Type* will be set to *Local*.



To use the variable to bring in OPC information, change the type setting to OPC. This will expose configuration items allowing you to select the OPC Group to put this variable into.

It will also allow you to enter in the actual OPC Item name. The example below will bring the data from OPC Item MotorStatus into the PlantWatch variable FromPLCMotorStatus



This new variable will now be connected to the group associated server and will be populated with the value for the item at the rate selected within the group.

The OPC item MotorStatus does not reflect a normal OPC item address which often includes more of the path within the PLC.

A real world example might look more like the following:  
Channel1.ThePLC.Global.WI\_JB.CoolingSystem.motorstatus.

This OPC item address starts with *Channel1*, which is the first device connection setup in Kepware that allows it to talk to AB stuff.

The second section, ThePLC, is the one and only PLC on the network setup within Kepware.

The rest of the address, Global.WI\_JB.CoolingSystem.MoveToNextStep, is the path thru the PLC where:

Global = Type of PLC tags

WI\_JB is a user defined datatype.

CoolingSystem is a member of WI\_JB and is a user defined data type.

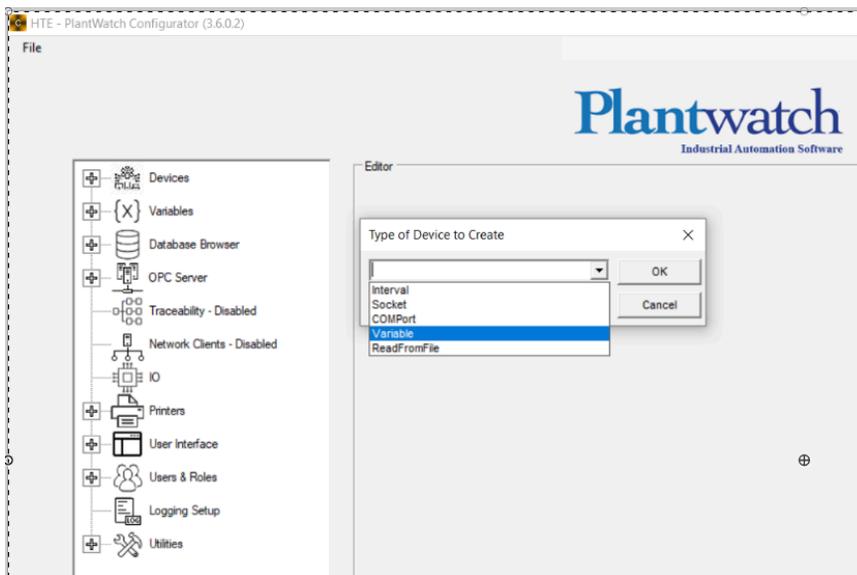
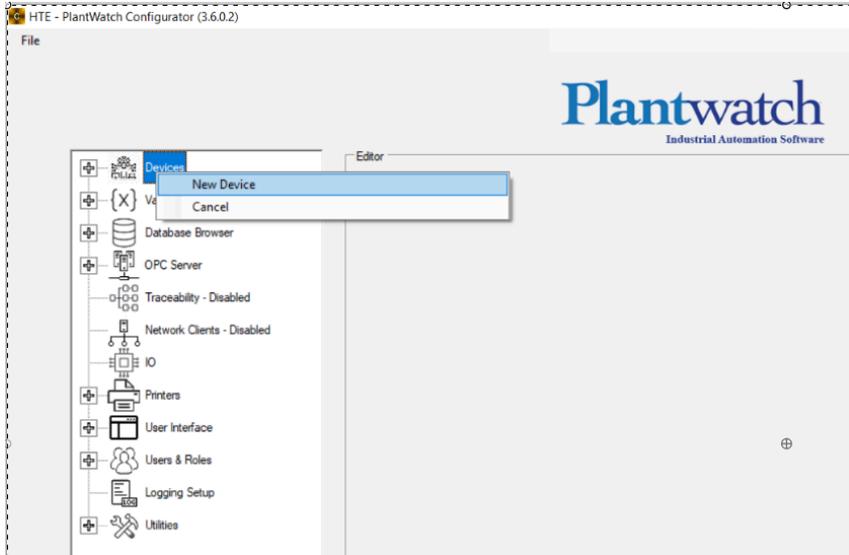
MotorStatus is a member of CoolingSystem

## Getting OPC Data out of PW.

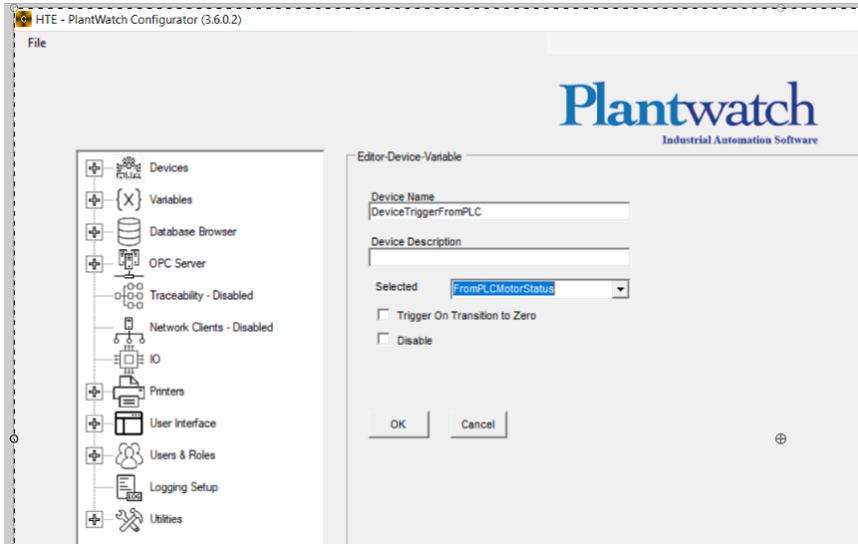
To get information from PW into an OPC device, you use the Logic Charts, selecting the WriteToOPC cell type.

The following screen shots will show how to configure PW to capture and record a PLC Tag to a text file.

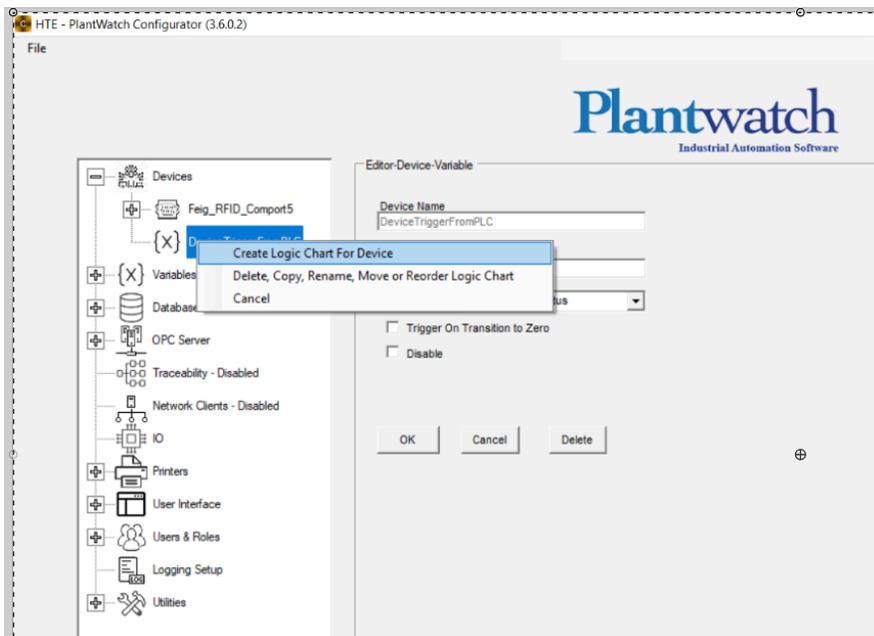
Define a device of Variable.

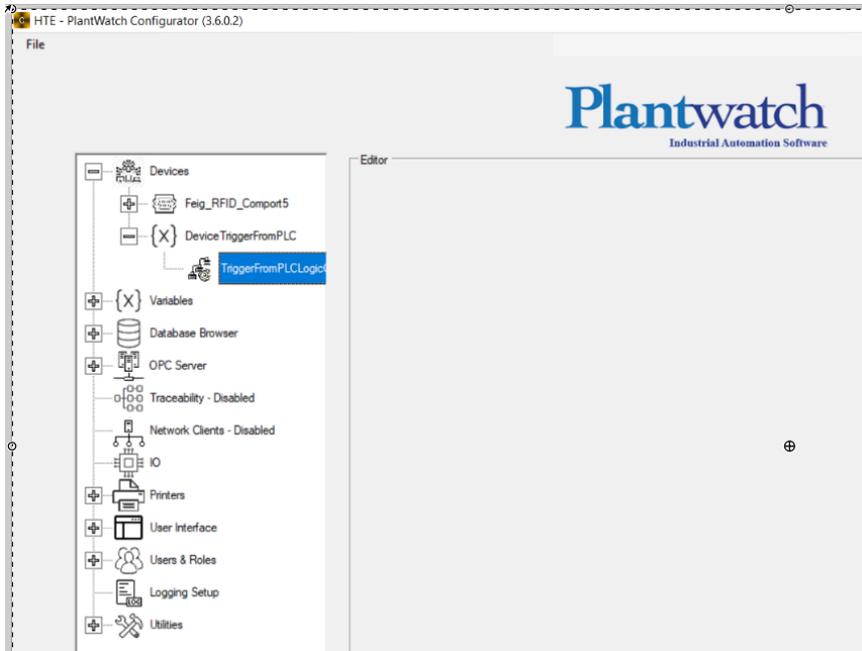


Connect the OPC Item (FromPLCMotorStatus) to the Device type of “Variable”. Each time the value of the FromPLCMotorStatus changes, the logic chart will fire and execute.

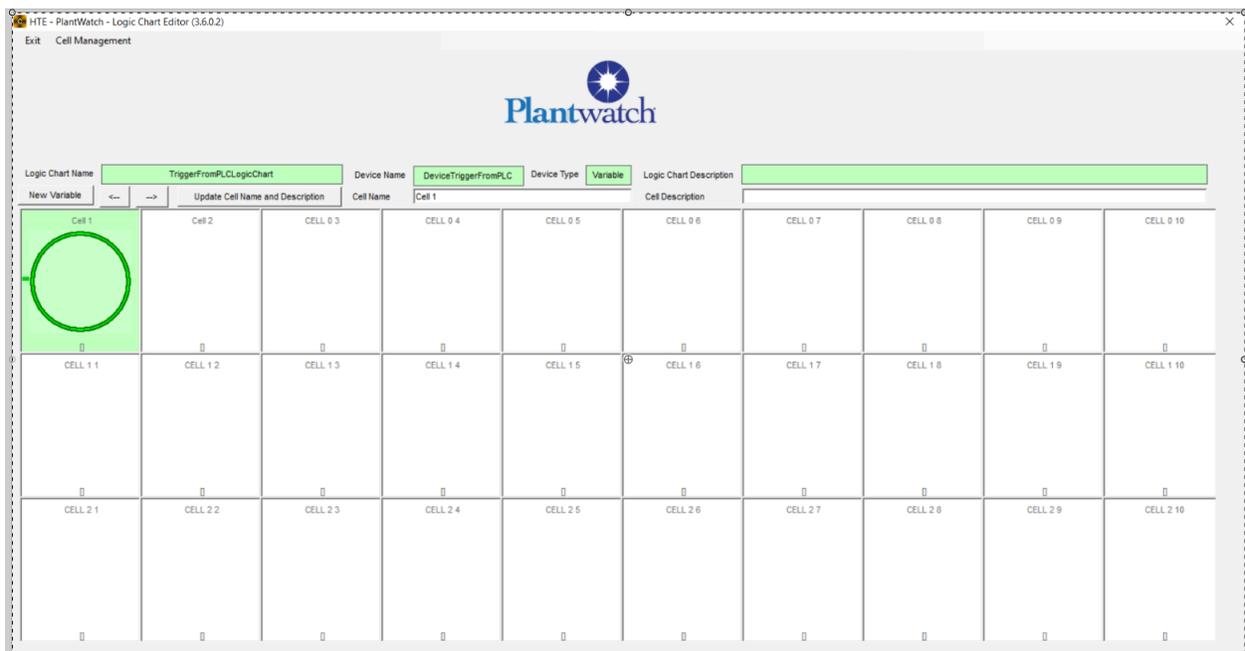


### Add a Logic Chart to the Device

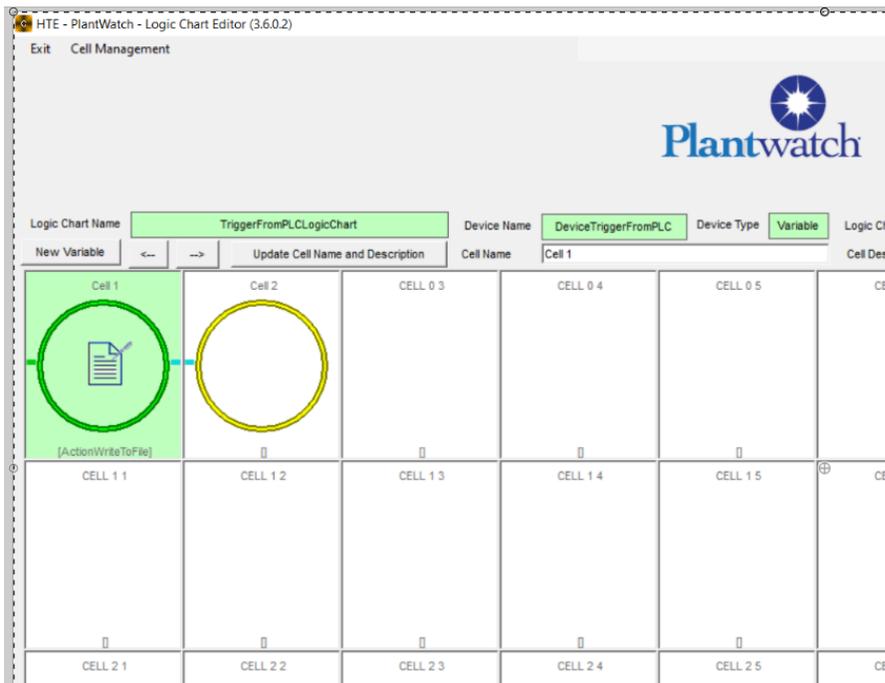
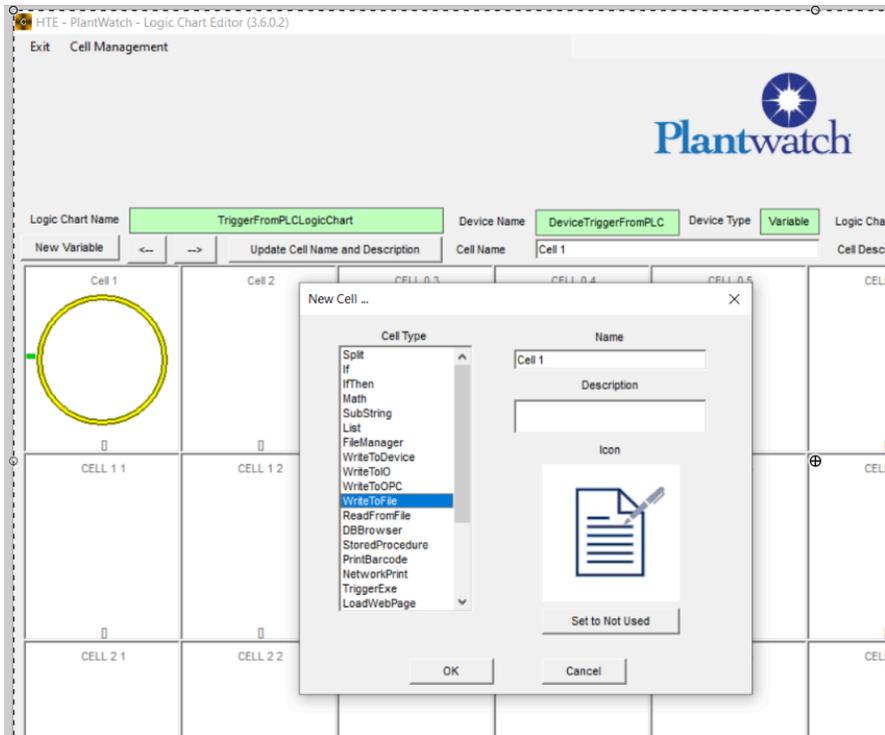




Double click on the logic chart name to open the logic chart editor.



Add a “WriteToFile” cell to the Logic Chart by double-clicking on the highlighted cell.



Configure the WriteToFile cell to write the value of the FromPLCMotorStatus to a text file located at “C:\PLCData.txt”. Each state change of the PLC Tag will cause the data to be appended to the file.

