**Configure MODBUS TCP for Smart Meter**

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# Version History

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| --- | --- | --- | --- |
| Version | Author | Date | Changes |
| 1.0 | Taki Guan | 2019-4-18 | Create Document |
| 1.0 | Taki Guan | 2019-4-23 | Finish Document |
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# Purpose

This is first time to use Modbus TCP DI server to communicate with the smart meter we use to capture power of T2BH0208.

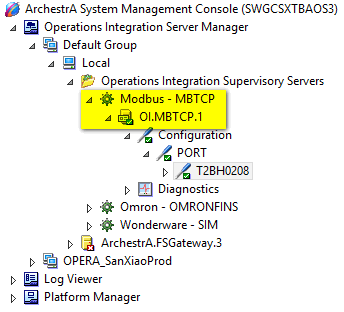
DI configuration and OPC client configuration are included in this document.

# Procedure

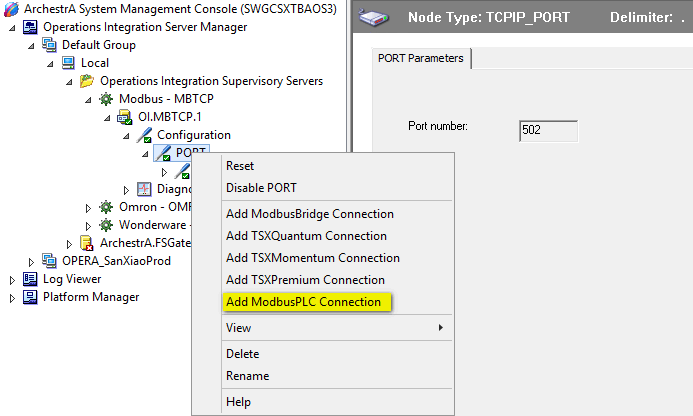
Download [Setup-MBTCP-OI] from AVEVA website and install it in one of AOS server. Here we installed in [SWGCSXTBAOS3].



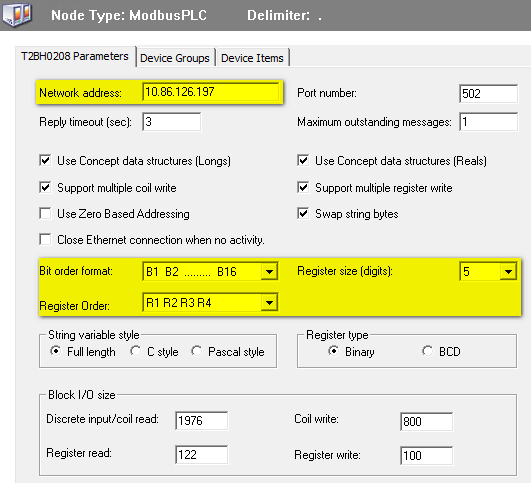
Expand [Operation Integration Server Manager] to make sure Modbus TCP OI server is installed correctly.



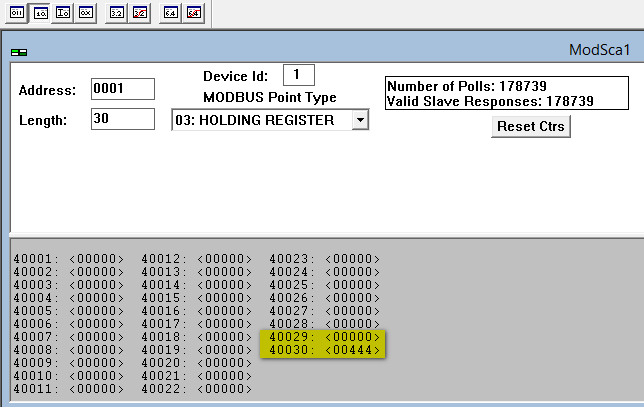
We can right click on the [Configuration] port to add a [ModbusPLC] connection. Remember the default port we use is 502.



After creating the [ModbusPLC] connection, we should modify the IP address to exact the Smart meter IP. Remember we need to change [Register size] digits to the same digits the smart meter use. The [Register Order] should be the same as smart meter also.

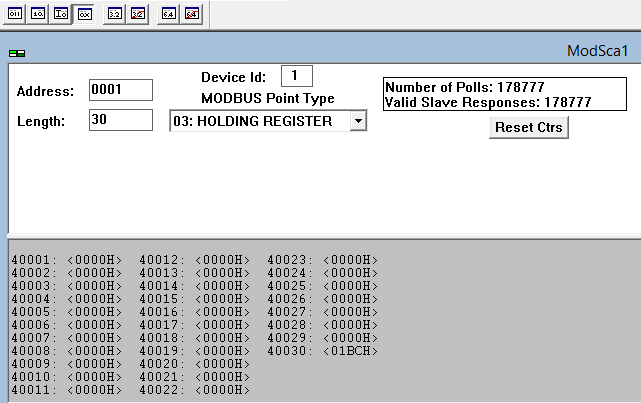


After the configuration, we should restart OI server to make the configuration take effect. Then we use [ModScan] tool to help to find the exact tag of the smart meter.



We can see the exact value stored in [40030] is 444, then we read it out. The result is exactly the same.





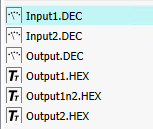
The issue we meet is the data in smart meter is stored as hex value in both [40029] and [40030]. The exact degree value stored in smart meter is [000001BC] HEX. But we read [40029] and [40030] out is 0 and 444 in DEC.

The solution we think is as below. We can convert these two tag value from DEC to HEX individually. Then we conbine these two HEX together as a string. Then convert the string to HEX value. At last we convert the HEX value to DEC value use system default function.

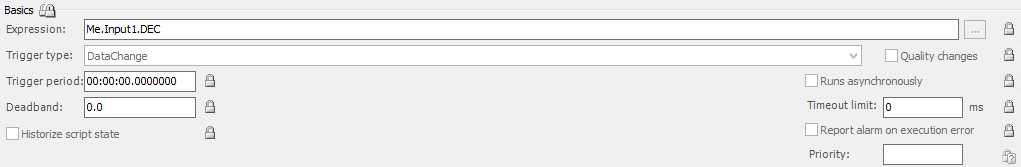


# Architecture

I design a template for the calculation. [ng\_Dec2Hex2Dec] have some attributes. [Input1.DEC] and [Input1.DEC] are the decimal value we read out from smart meter PLC. [Output1.HEX] and [Output2.HEX] are hexadecimal values converted from decimal values. [Output1n2] is the combined string of [Output1.HEX] and [Output2.HEX].

We can use .NET function [ToString]1 to convert decimal value to hexadecimal value.



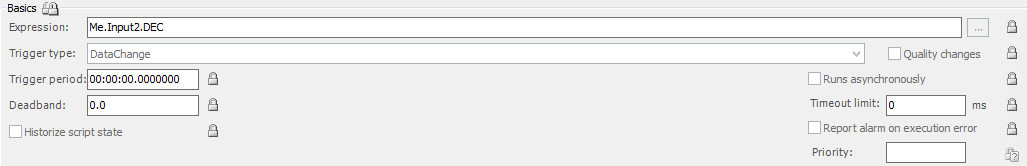
dim vInput1 as integer;

dim vHex as string;

vInput1 = Me.Input1.DEC;

vHex = vInput1.ToString("X4");

Me.Output1.HEX = vHex;



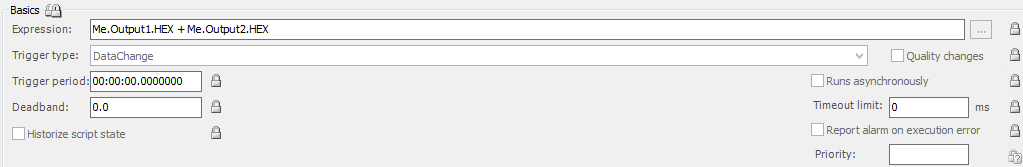
dim vInput2 as integer;

dim vHex as string;

vInput2 = Me.Input2.DEC;

vHex = vInput2.ToString("X4");

Me.Output2.HEX = vHex;



The we use [INT32.Parse] function to convert hex value to decimal.

dim vHex1 as string;

dim vHex2 as string;

dim vHexCombine as string;

vHex1 = Me.Output1.HEX;

vHex2 = Me.Output2.HEX;

vHexCombine = vHex1 + vHex2;

Me.Output1n2.HEX = vHexCombine;

*'Convert HEX to DEC*

Me.Output.DEC = System.Int32.Parse(vHexCombine, System.Globalization.NumberStyles.HexNumber);

# Reference Link

1. [Formatting Types in .NET](https://docs.microsoft.com/en-us/dotnet/standard/base-types/formatting-types?view=netframework-4.8#customStrings)
2. [InTouch HMI Scripting and Logic Guide](https://www.logic-control.com/datasheets/1/InTouch/ITScriptsAndLogic.pdf)