Application Note #1194: Interfacing Proface panels to WAGO I/O nodes via the ODVA Explicit Device driver

Introduction

The purpose of this document is to provide a guide explaining how this example project was created interfacing the WAGO 750-341 Fieldbus Coupler with the Proface AGP 3000 series using the ODVA Explicit Device driver via Ethernet/IP protocol. In this example, the AGP3300-T1 functions as an Ethernet/IP scanner and uses Common Industrial Protocol (CIP™) to manage the inputs and outputs (I/O) of the WAGO node (also known as "implicit messaging").

Prerequisites:

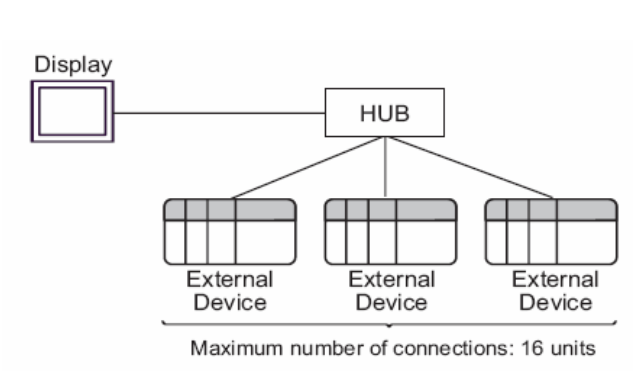
It is assumed you have previous knowledge of using GP-ProEX and setting up the WAGO device.

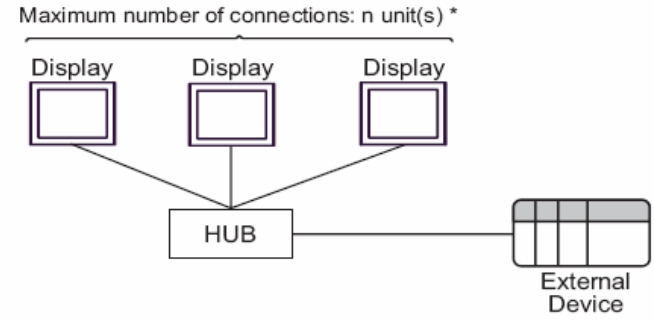
In very general terms a CLASS object is a container (array) of data. To select a specific analog channel the offset needs to be specified (INSTANCE). Determining if this data is being written to or read from the correct value is specified by the (ATTRIBUTE) i.e. GET or SET service.

In the case of WAGO, the object number (CLASS) representing the physical I/O's data using 65 & 66 hex-decimal (HEX) for discrete I/O and Analog by 67 & 68 HEX in this example. There are others supported but it goes beyond this app note. The WAGO object supports from 0 to 255 instances. In the case of discrete I/O, the Proface's smallest amount of data that can be defined is 16 bits (2 byte integer), however individual bits within these integers can be used in bit switches, alarms etc.

Cable Diagram:

Standard Ethernet cables and hubs and/or switches are required. The term External Device below refers to WAGO Fieldbus Couplers, not individual I/O Modules.





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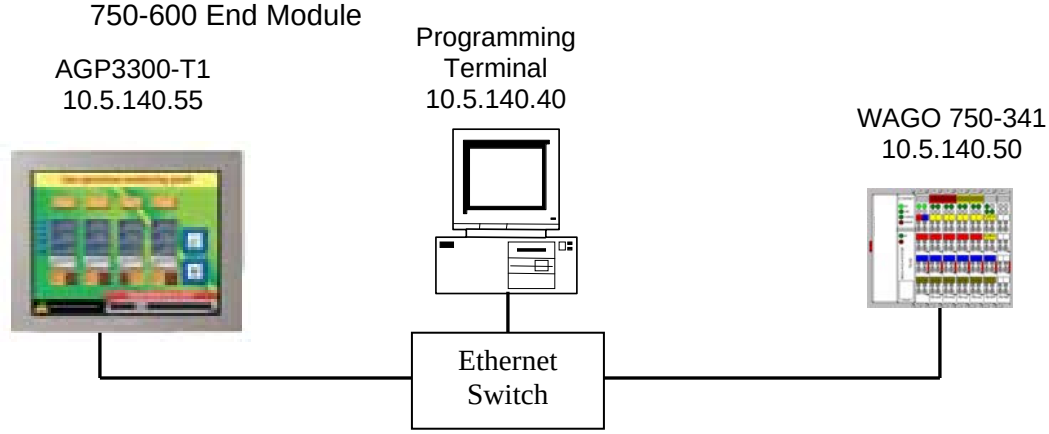
Set Up:

This procedure has been tested with an AGP3300-T1, but is not limited to just this unit.

Proface AGP & LT 3000 series HMI's with Ethernet programmed with GP-ProEX 2.6 or higher can also be used.

- WAGO Ethernet Node
  - 750-341 Ethernet Fieldbus Coupler
  - 750-402 4-point 24VDC Digital Input Module
  - 750-504 4-point 24VDC Digital Output Module
  - 750-467 2-point 0-10VDC Analog Input Module
  - 750-550 2-point 0-10VDC Analog Output Module
  - 750-600 End Module



NOTE: This procedure assumes that the WAGO 750-341 contains a valid IP address and it is installed on a working network, along with the Proface HMI and GP-ProEX programming tool. If necessary, refer to WAGO's Application Note A202900 for assigning a static IP address to the WAGO 750-341.

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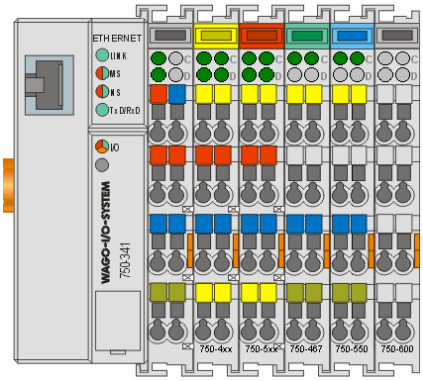
The figure below illustrates the hardware of the WAGO node in this example. The process image table (I/O map) is displayed in byte format below the figure. In order to properly configure the AGP 3300, the process image of the WAGO node must be determined.

When the coupler is powered up, it automatically addresses the I/O modules of the node. The data for complex modules (modules using 2 or more bytes) are mapped first in the process image. They are mapped in the order of their physical position after the coupler. As such, they start at byte address 0. Following this, the digital modules are grouped into bytes (8-bits per byte). The bits are arranged in the order of the module's location. When the number of digital points exceeds eight (8-bits), the coupler automatically starts the next byte.



Input Process Image

Byte 0 - 750-467 Channel 1 Analog Input, Low Byte

Byte 1 - 750-467 Channel 1 Analog Input, High Byte

Byte 2 - 750-467 Channel 2 Analog Input, Low Byte

Byte 3 - 750-467 Channel 2 Analog Input, High Byte

Byte 4 - 750-402 4-Channel 24VDC Digital Input (bits 0 through 3)

Output Process Image

Byte 0 - 750-550 Channel 1 Analog Output, Low Byte

Byte 1 - 750-550 Channel 1 Analog Output, High Byte

Byte 2 - 750-550 Channel 2 Analog Output, Low Byte

Byte 3 - 750-550 Channel 2 Analog Output, High Byte

Byte 4 - 750-504 4-Channel 24VDC Digital Output (bits 0 through 3)

Note: This example has 5-bytes of data in both the Input and Output Process Image.

There are two main steps in setting up this system: **This document addresses step 2 only.**

1) Configuring WAGO's 750-341 for Ethernet/IP
2) Configuring the explicit messages for the AGP 3300-T1.

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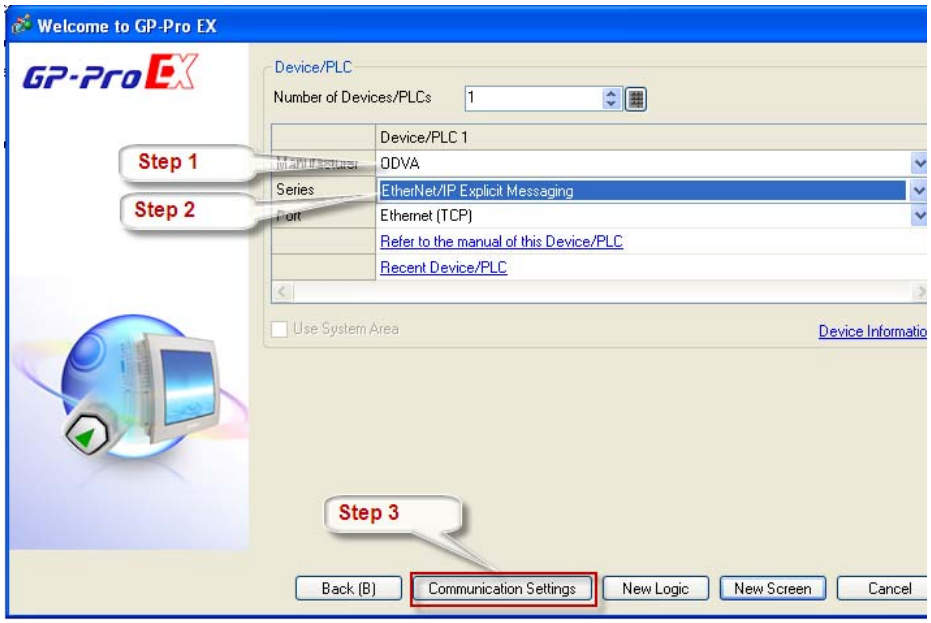
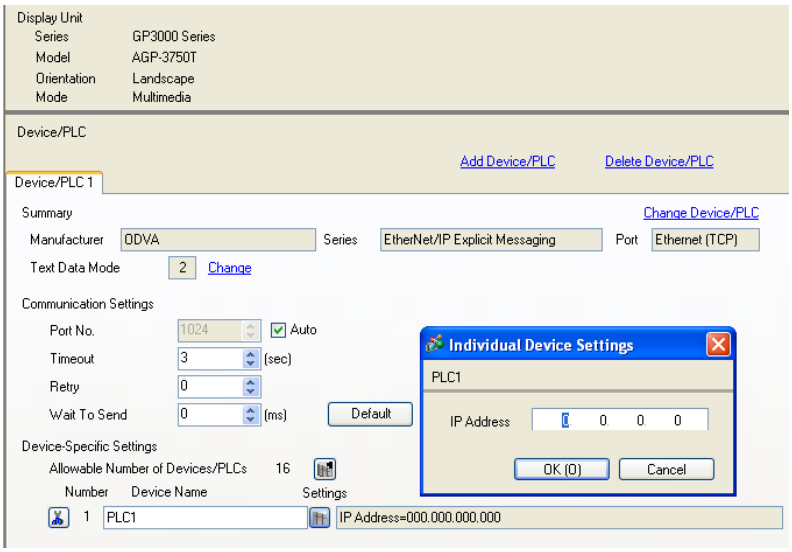
GP-Pro EX Communication Set Up:

If starting a new project select the ODVA Ethernet/IP Explicit Messaging driver





Enter the correct IP Address for the WAGO node and select OK

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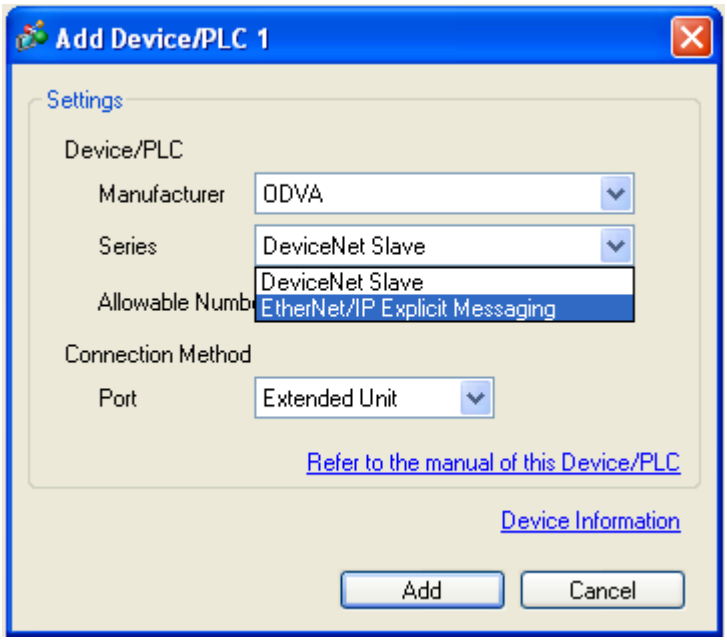
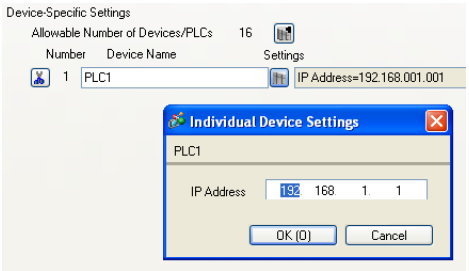
To add a driver to an existing system go to System Settings> Device/PLC and add the following driver support to the project.



Select ODVA for the Manufacture and EtherNet/IP Explicit messaging



Click on the settings button and enter the IP address for the WAGO node

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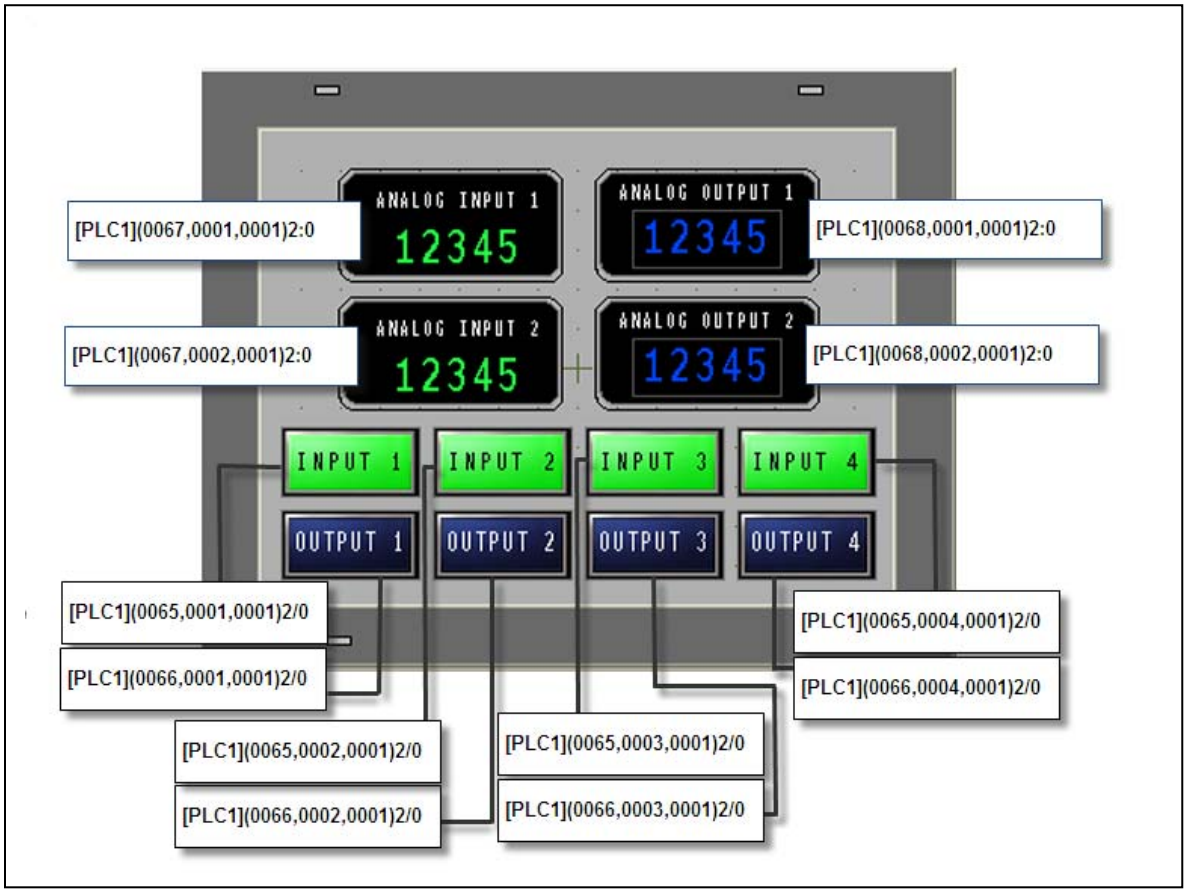
GP-Pro EX Parts Addressing, Screen Set Up, and Usage:



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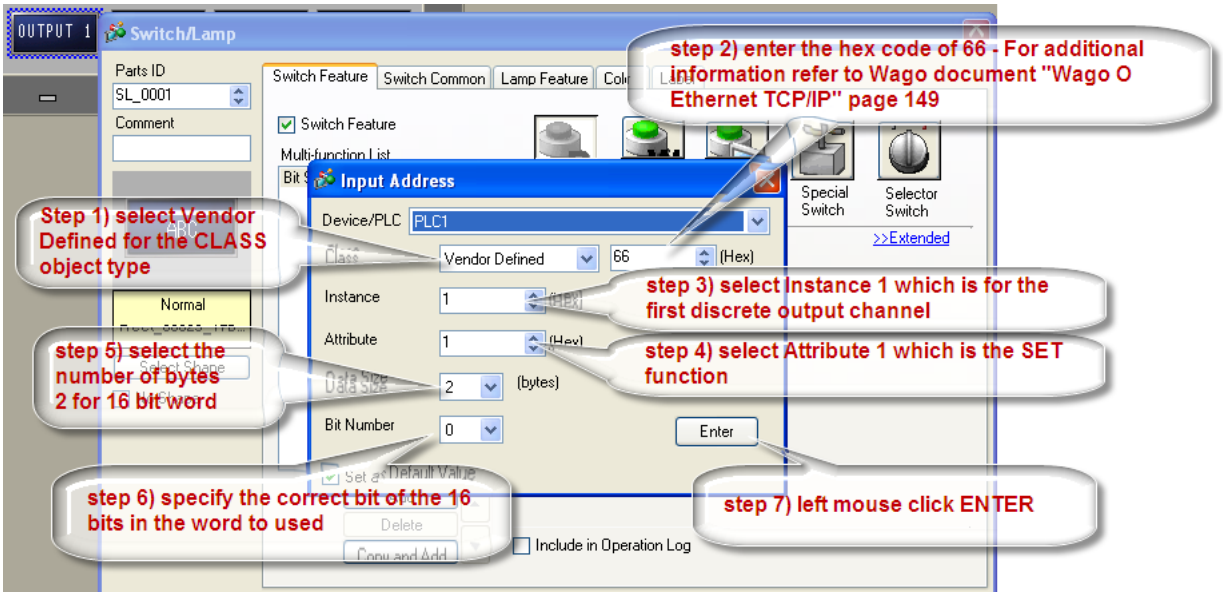
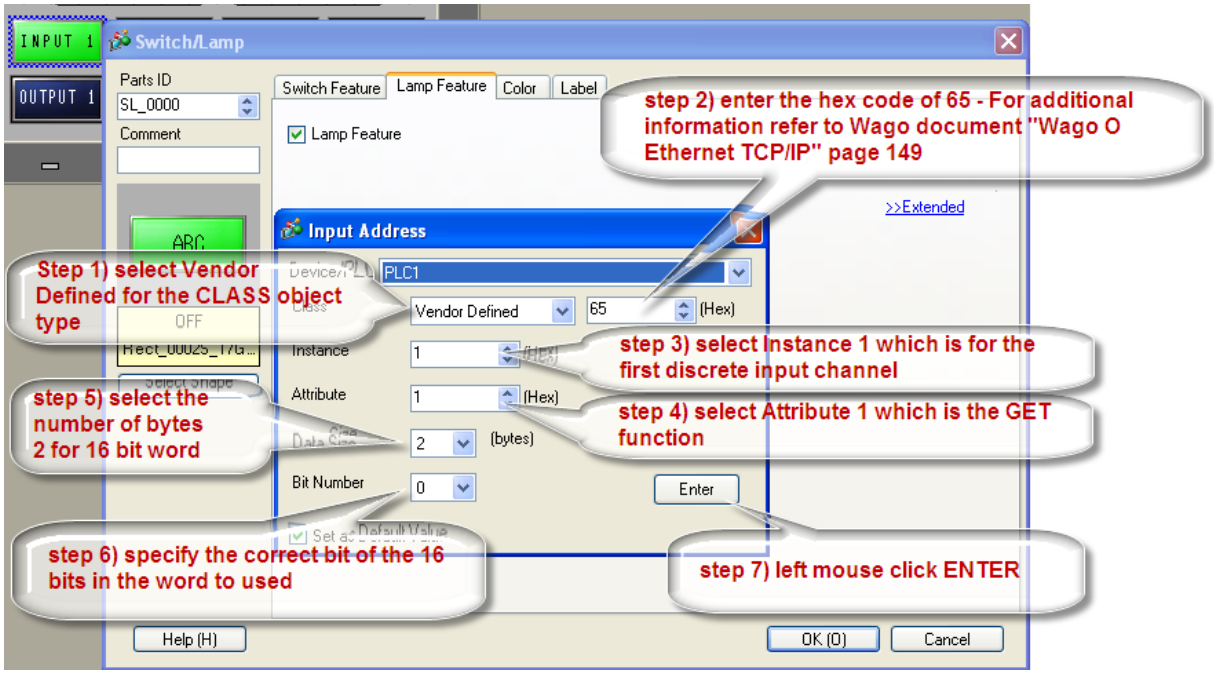
How to:

The following are the steps to assign the CLASS, INSTANCE, ATTRIBUTE values for each type of display object in the example project as they pertain to the physical I/O node shown in below





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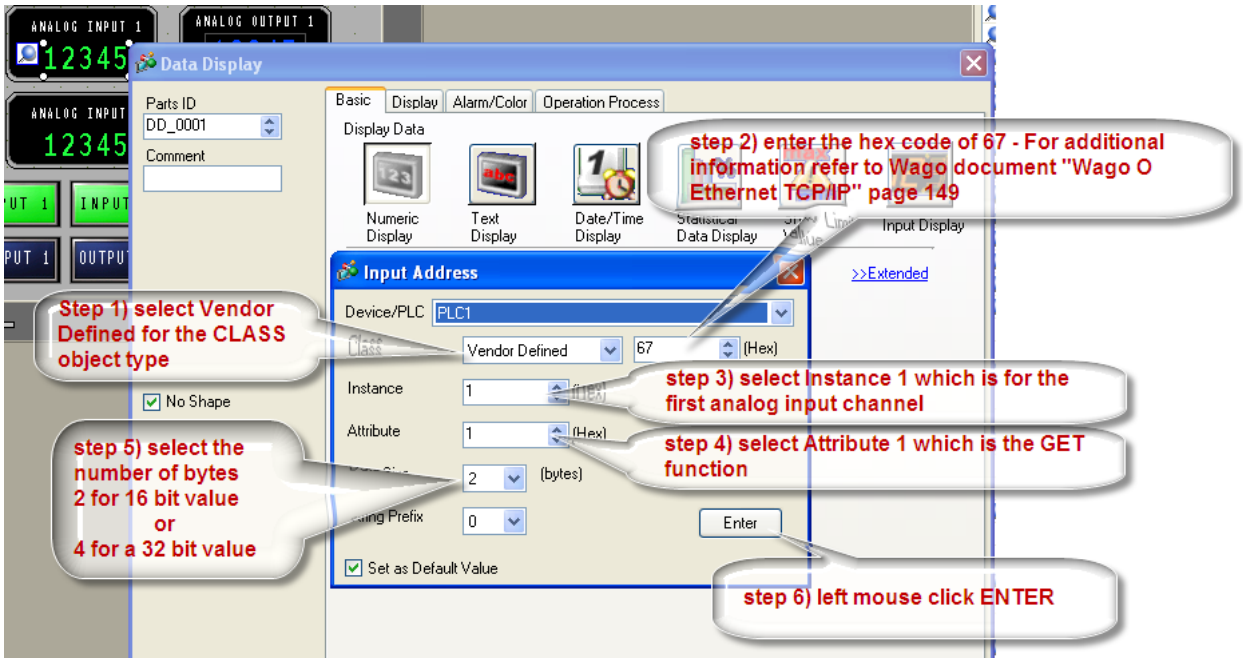

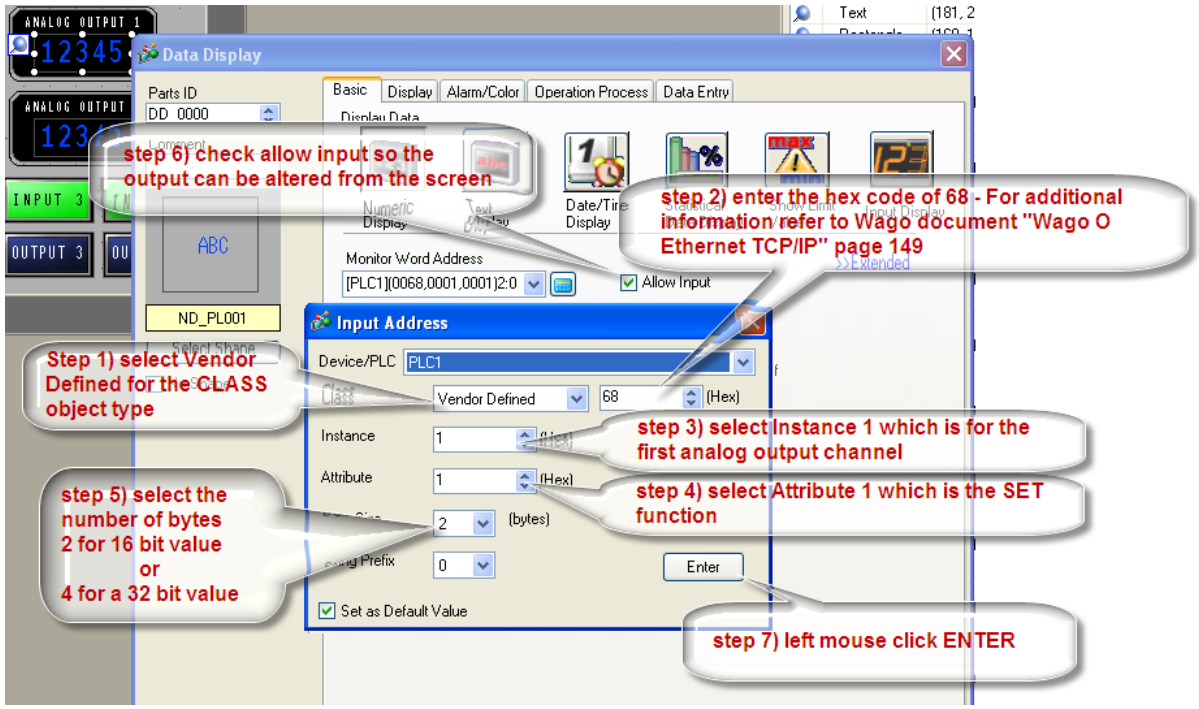

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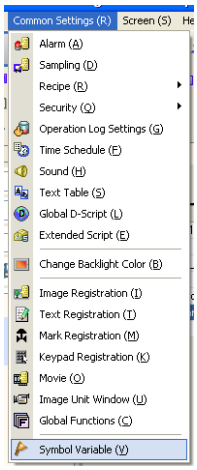
Optional:

Instead of declaring all the setting for every object used, another option is to create SYMBOL names that are declared once and reused often.

To show the Symbol/Variable list, if not shown, click Common Settings in the menu bar and then Symbol/Variable:

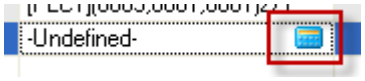


To create symbols:

1. Left mouse click in the next empty cell in the NAME column and enter the desired descriptive symbol name. NOTE: No spaces are allowed in the symbol name

2. Select the type of required address (Bit or Word address) Note: for a DINT or FLOAT type select Word Address type. Do not use Variables (INT, Float or Real) as these are only for referenceing variables internal to the HMI panel.

3. Left mouse click the small calculator button



To add additional symbols to the list follow the steps outlined above to define the correct CLASS, INSTANCE and ATTRIBUTE settings for this piece of data.

See figure 2 below for the symbols created in this example project

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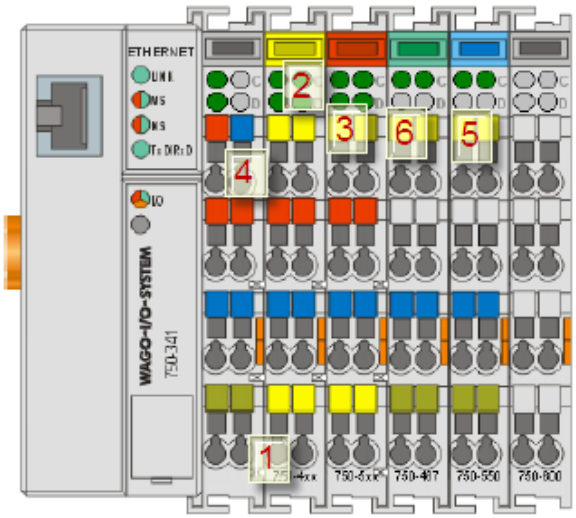

	Name	Type	Address	Comment
1	forward_travel_limit	Bit Address	[PLC1](0065,0003,0001)2/0	third input bit first module
2	start_button	Bit Address	[PLC1](0065,0002,0001)2/0	second input bit first module
3	advance_sol	Bit Address	[PLC1](0066,0001,0001)2/0	first output
4	discrete_input1	Bit Address	[PLC1](0065,0001,0001)2/0	first input bit first module
5	speed_command	Word Address	[PLC1](0068,0001,0001)2:0	first analog channel output
6	speed_reference_feedback	Word Address	[PLC1](0067,0001,0001)2:0	first analog input

Figure 2

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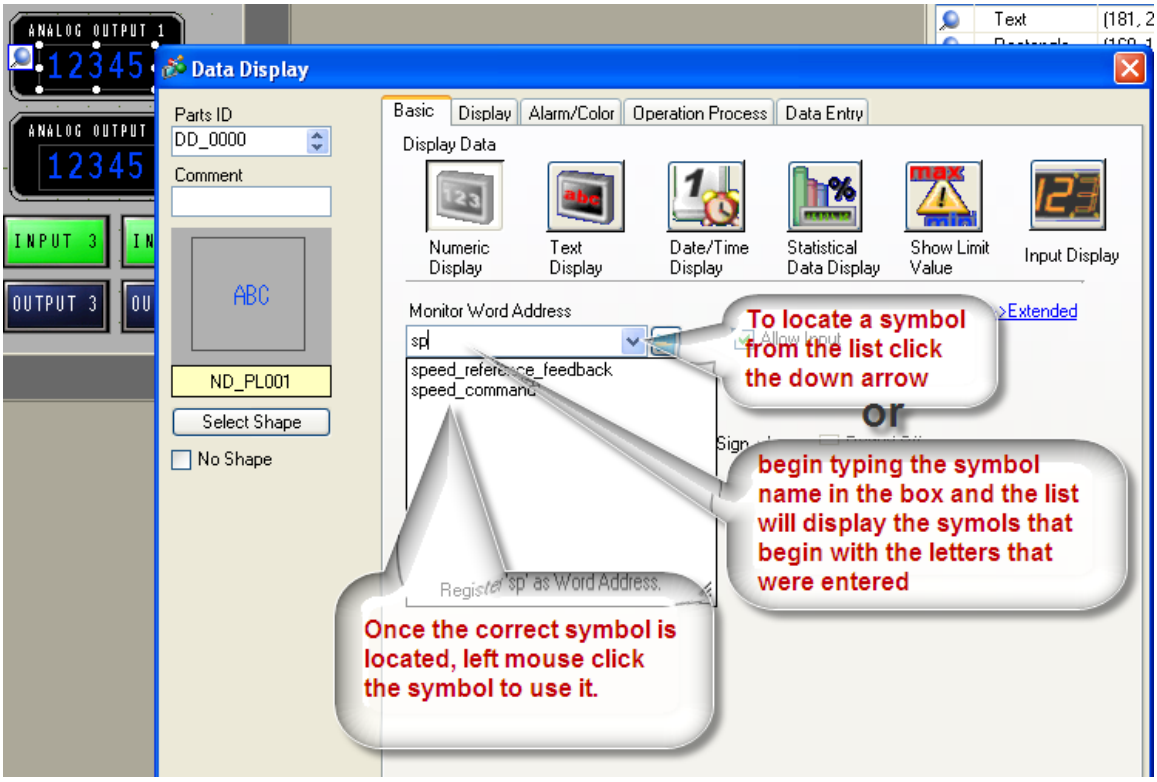
To utilize the symbols locate the correct symbol in the list and then left mouse click on the symbol name in the list.



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