How to Configure Pro-face HMI with Siemens PLC

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1 Application Description

- **Objective**

 This document describes how to use Pro-face GP-4501TW to control and monitor Siemens PLC.

- **Goals**

  This document covers the following topics:

  – How to use Pro-face GP-4501TW.

  – How to use the Pro-face screen editor tool, **GP-Pro Ex**.

  – How to use Pro-face HMI to control and monitor Siemens PLC.

2 System Topology

The following figure shows the system architecture in which the Modbus end devices, PowerFlex 4M and IAQPoint2, are connected to the serial port on MGate 4101-MB-PBS through RS-485-2W wiring. MGate 4101-MB-PBS is connected to the PROFIBUS port on Siemens PLC via a PROFIBUS cable. PC (running SIMATIC Step 7) is connected to an Ethernet switch port on Siemens PLC via an Ethernet cable. A fan is connected to PowerFlex 4M that outputs electric current to power the fan. Pro-face GP-4501TW controls and monitors Siemens PLC via Ethernet connection.

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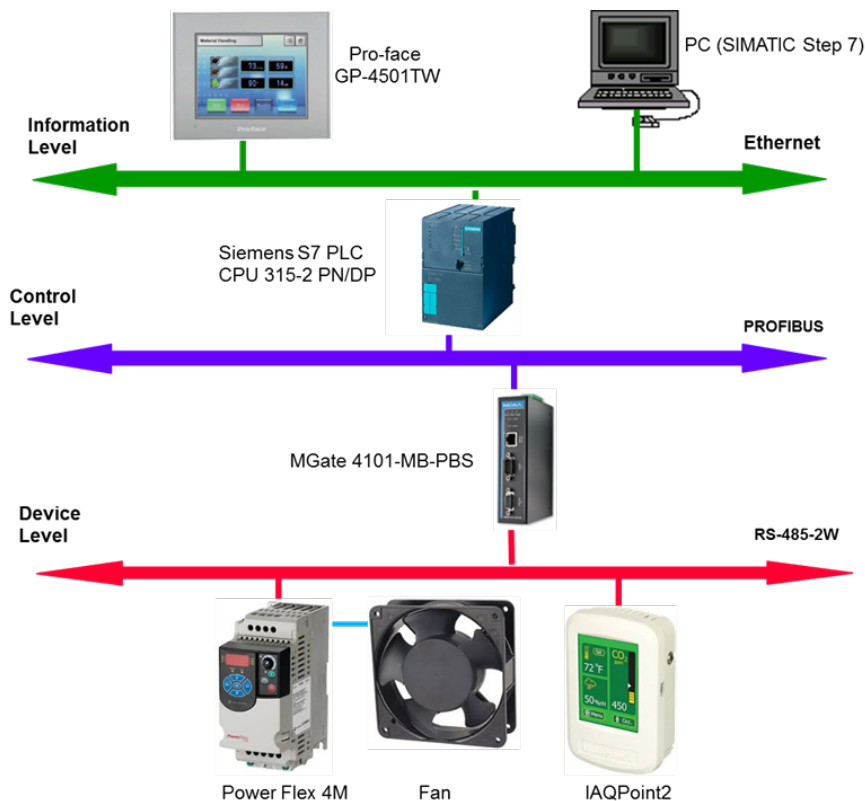
3 Hardware and Software Requirements

3.1 Hardware Requirement

A. Pro-face GP-4501TW

Pro-face GP-4501TW is a 10.4-inch TFT color, touch screen with operator interface.

B. For information on other hardware requirements, refer to the *Configuring Siemens S7-300 PLC with Moxa MGate 4101-MB-PBS*.

3.2 Software Equipment

A. GP-Pro EX:

This is the screen editor utility published by Pro-face.

Rev.: V3.5

B. For information on other software requirements, refer to the *Configuring Siemens S7-300 PLC with Moxa MGate 4101-MB-PBS*.

4 Configuration

4.1 Hardware Installation

1. **Serial Wiring**

For information on installing PowerFlex 4M and IAQPoint2, refer to the *Configuring Siemens S7-300 PLC with Moxa MGate 4101-MB-PBS*.

2. **Ethernet Connection**

- Connect **CPU 315** to the **PC** running SIMATIC Step7 through an Ethernet connection to one of the two Ethernet connectors, either directly or through a common Ethernet switch.
- Connect the PROFIBUS cable from the PROFIBUS port on **CPU 315** to the PROFIBUS port on **MGate 4101-MB-PBS**.
- Connect the Ethernet port on the **Pro-face GP-4501TW** to an Ethernet port on **CPU 315**.
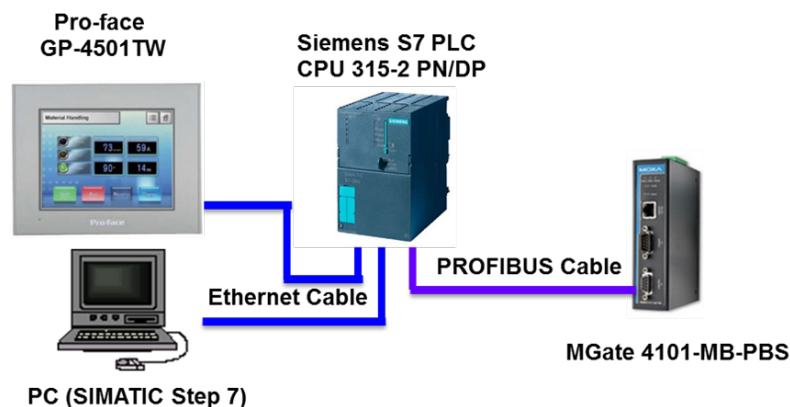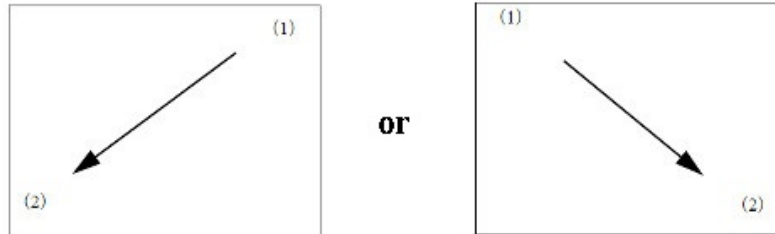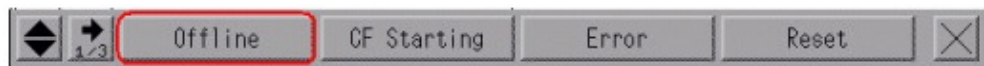
3. **Pro-face GP-4501TW IP Setup**

    a. Touch either the top right hand corner then the bottom left hand corner OR the top left hand corner and then the bottom right hand corner within 0.5 seconds.
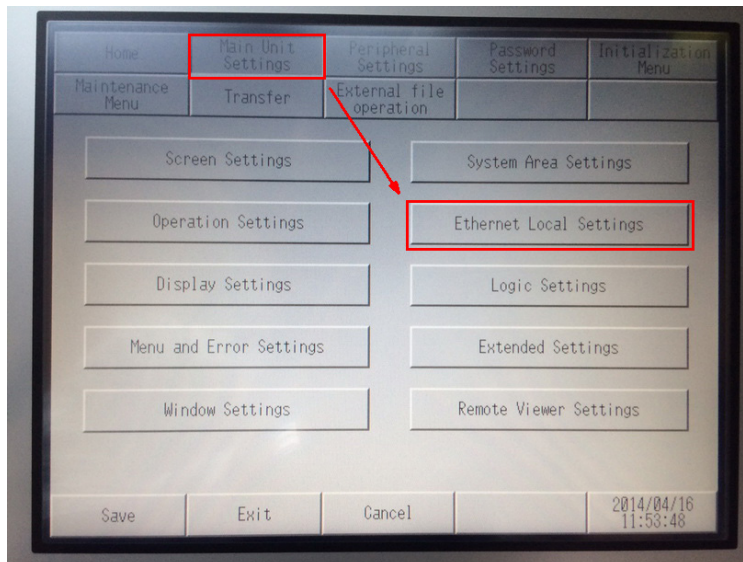   **Note:** Do not touch both corners at the same time.

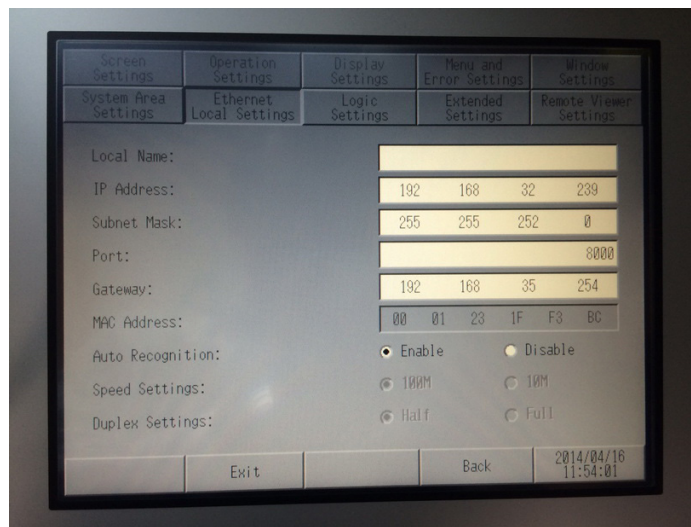   b. A menu appears on the screen as shown in the following figure. Touch **Offline**.

    c. Touch **Main Unit Settings → Ethernet Local Settings**.

> d.   Configure the **IP address** and **Subnet Mask** fields.

4.   For information on other hardware settings, refer to the *Configuring Siemens S7-300 PLC with Moxa MGate 4101-MB-PBS*.

4.2 Configuring GP-Pro EX

1.   **Creating a New project**

   a.   Start the GP-Pro EX application.

   b.   The Welcome to GP-Pro EX window appears. Select **New** and click **OK**.
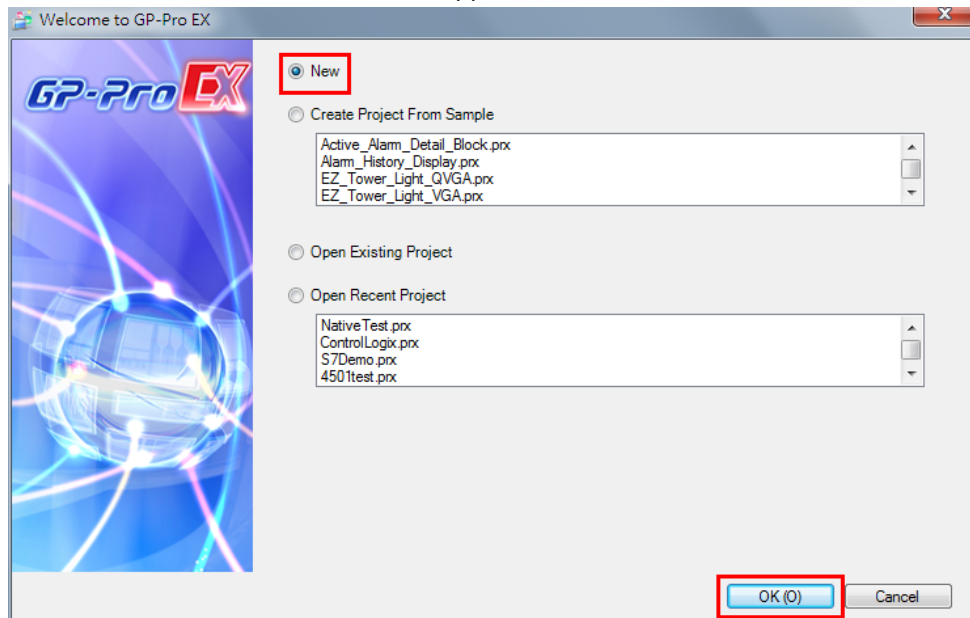
c. Configure the following **Display Unit** settings and click **Next**.
- **Series:** Select **GP 4000 Series** and **GP-45** Series** from the drop-down lists.
- **Model:** Select **GP-4501TW** from the drop-down list.
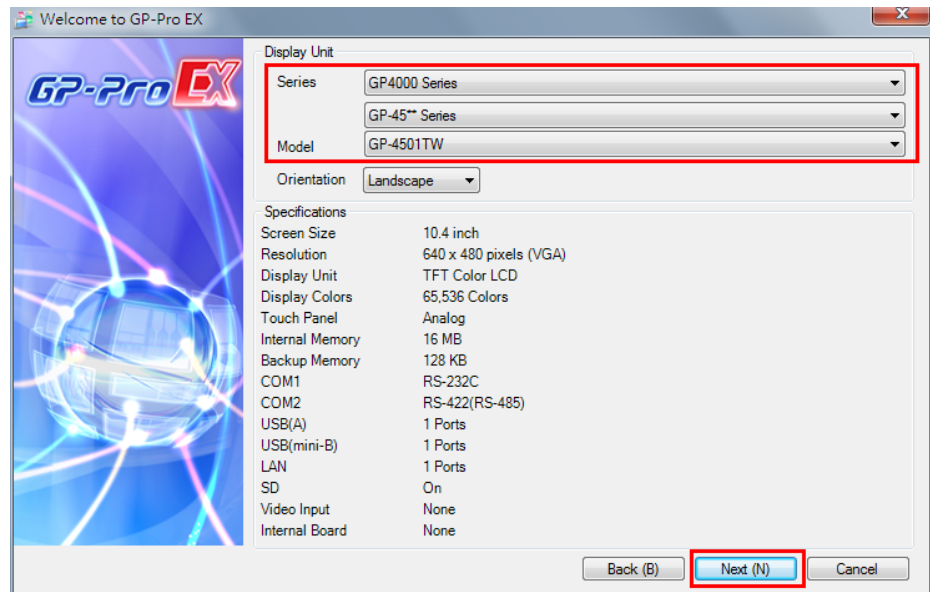
d. In the Device/PLC screen, configure the following fields and click **New Screen**:
- **Manufacture:** Select **Siemens AG** from the drop-down list.
- **Series:** Select **SIMATIC S7 Ethernet** from the drop-down list.
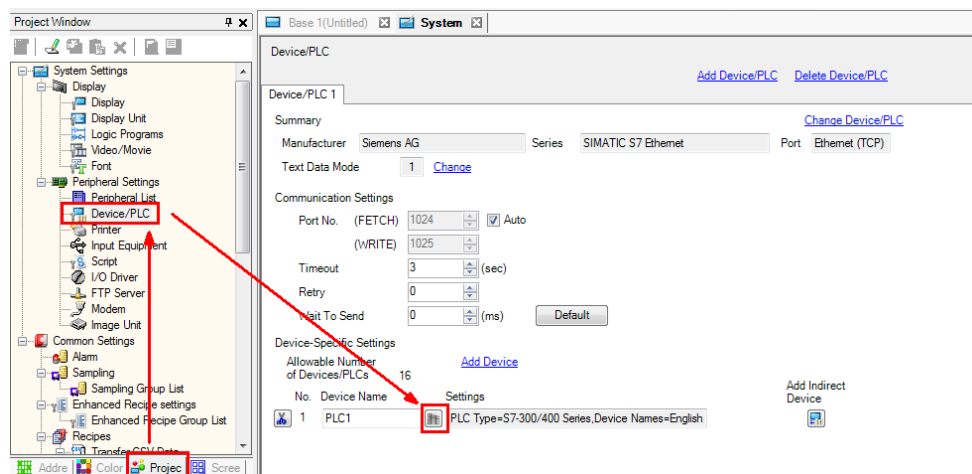- **Port:** Select **Ethernet (TCP)** from the drop down list.
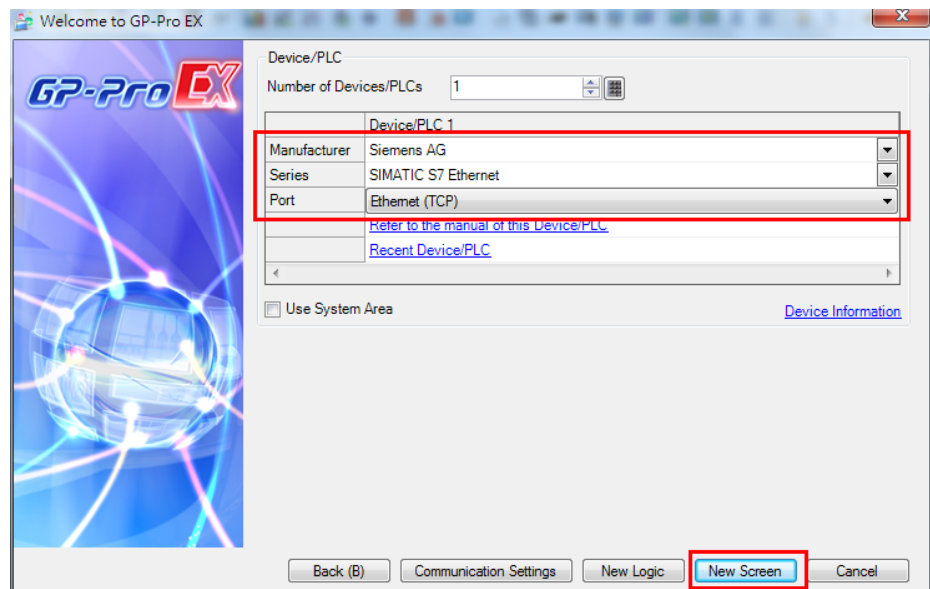
The system closes the Welcome screen and creates a Base Screen as shown in the following figure
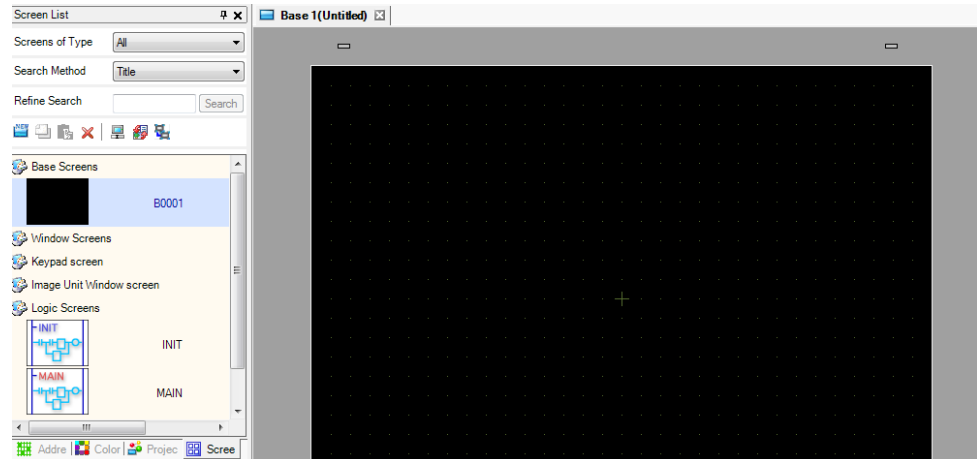
2. **PLC Connection Setup**
   a. Click the **Project** tab and select **Device/PLC**.
   b. In the **Device/PLC 1** configuration area, click the icon next to **PLC1** as indicated in the following figure.

c.   In the PLC1 settings screen, configure the following fields and click **New**:

- **Destination IP Address:** Enter the IP address.
- **Connection Type:** Select **OP Communication** from the drop-down list.
- **CPU Rack Number:** Enter "0".
- **CPU Slot Number:** Enter "2".
- **Use Tag Data:** Select this check box.

d.   The **Add Tag** screen appears. Click **Add**.
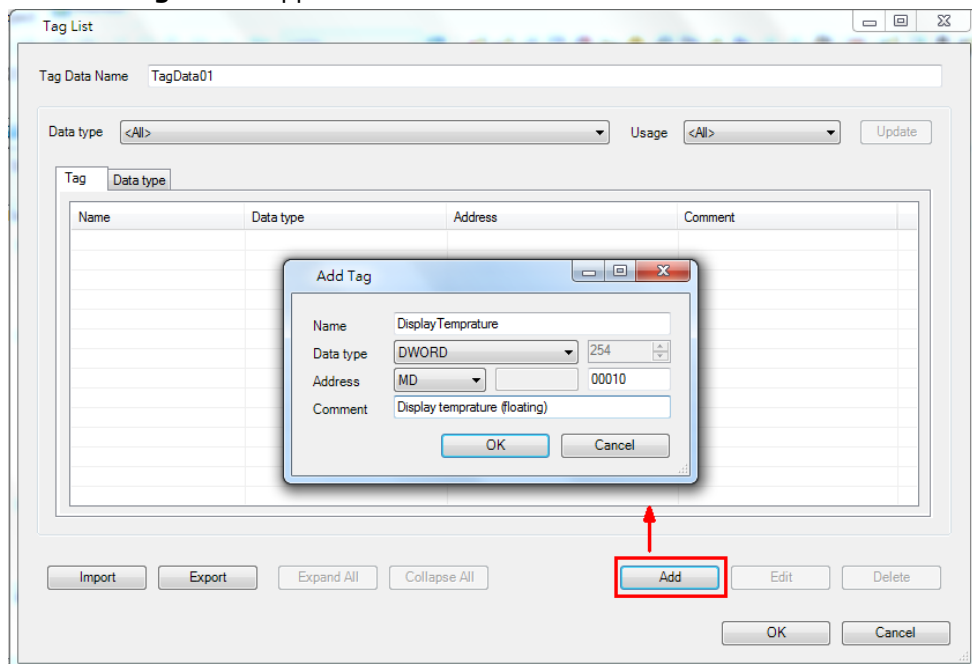
e.   In the **Tag List** screen, add the tags as shown in the following figure.
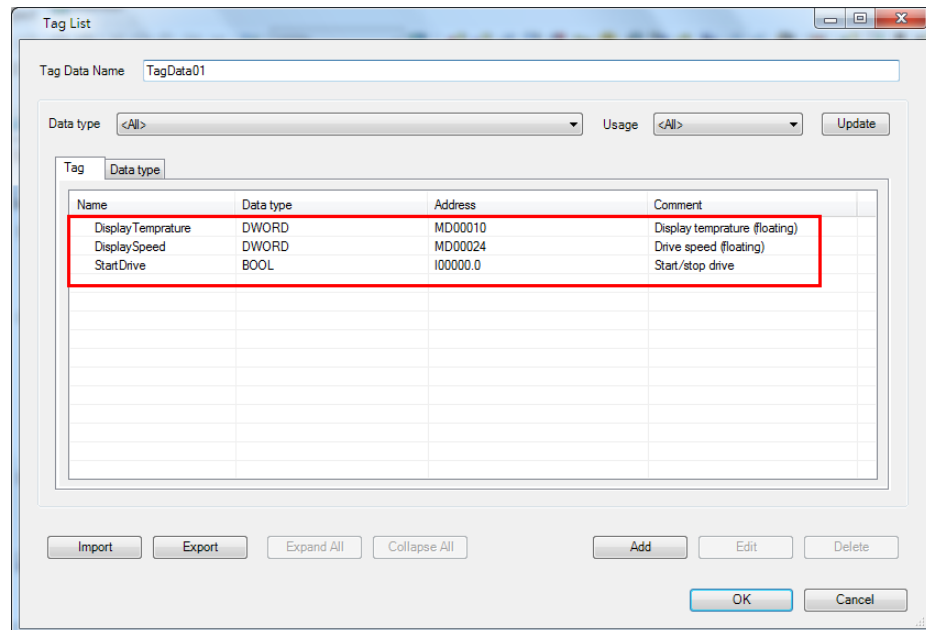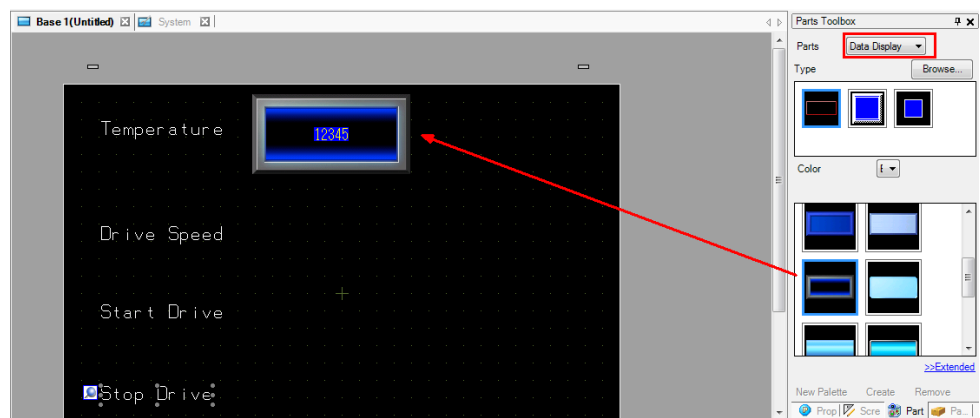
3. Using the Edit Screen

a. In the **Base 1** screen window, use the **Text** tool to create Text Objects as shown in the following figure.
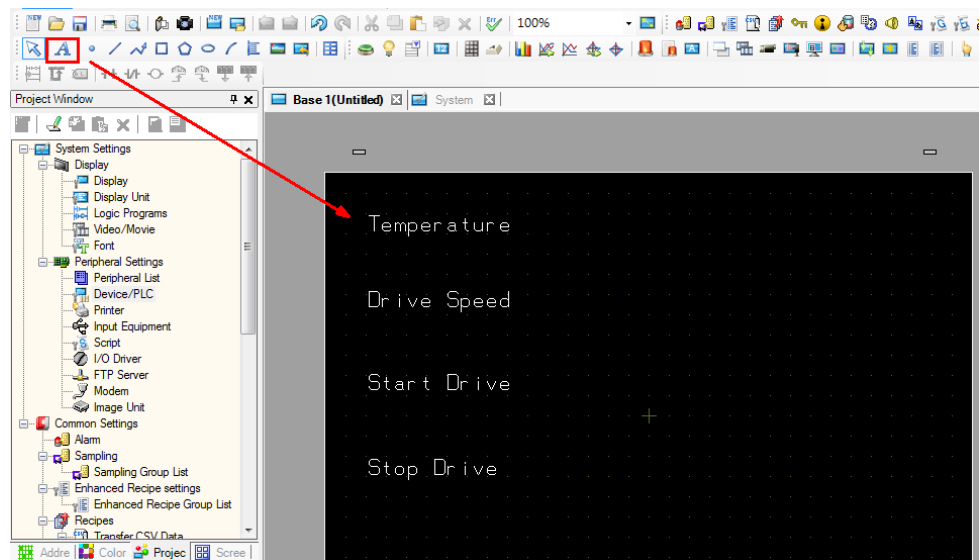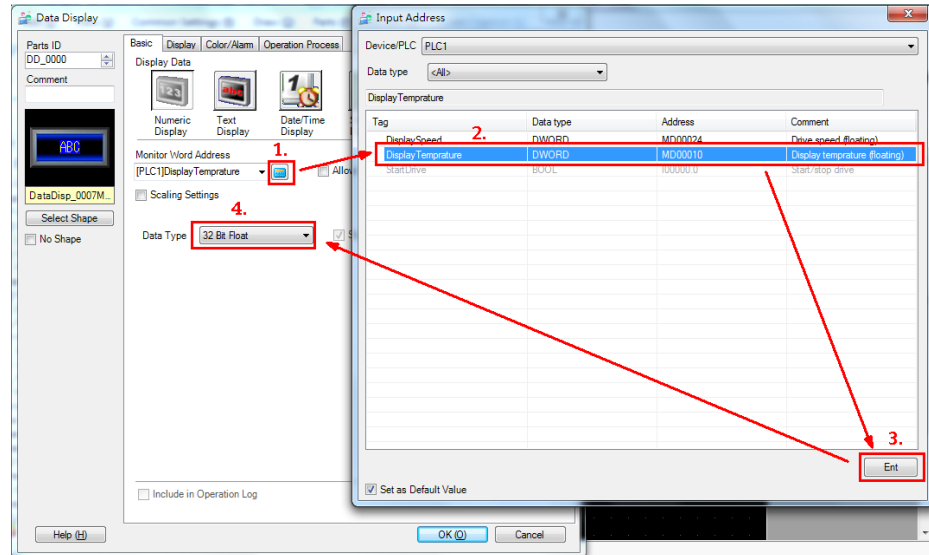

b. In the **Parts Toolbox** pane, select **Data Display** from the **Parts** drop-down list and drag a data display element to the screen next to **Temperature**.
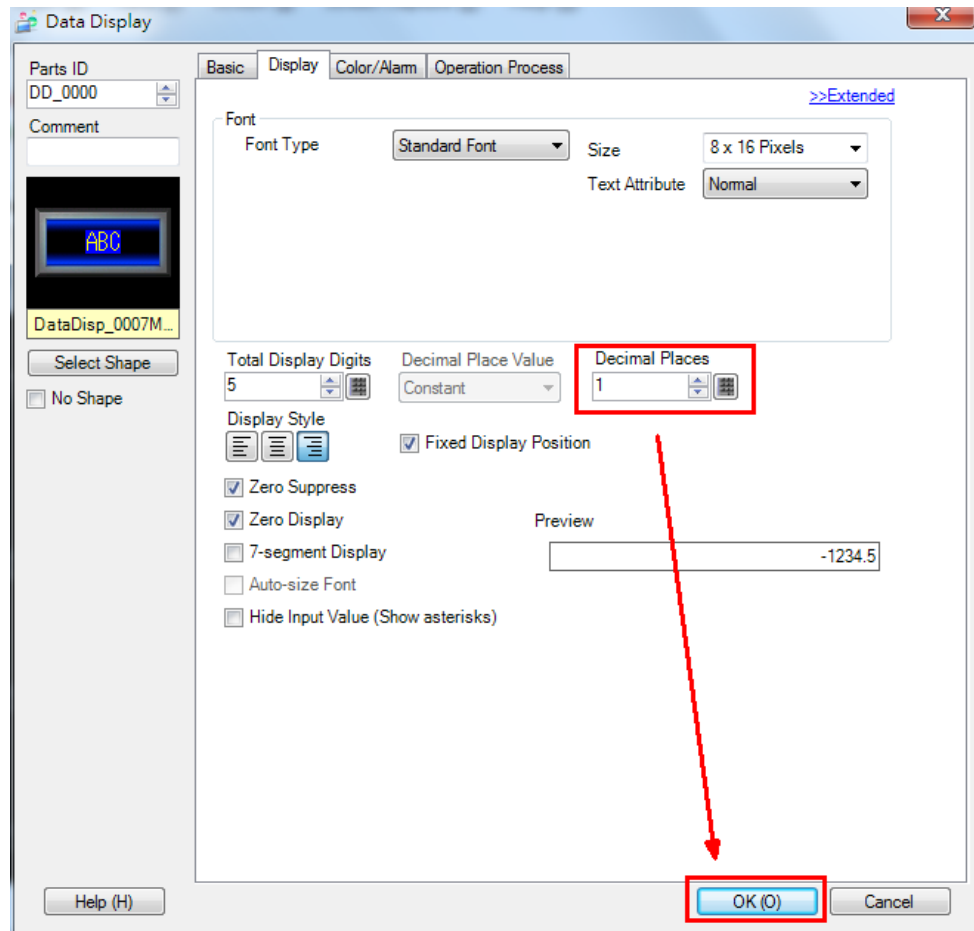
c. Double-click the **Data Display** element to configure its properties.
    i. Click the icon next to the **Monitor Word Address** field and select the **DisplayTemperature** tag.
    ii. Click **Ent**.
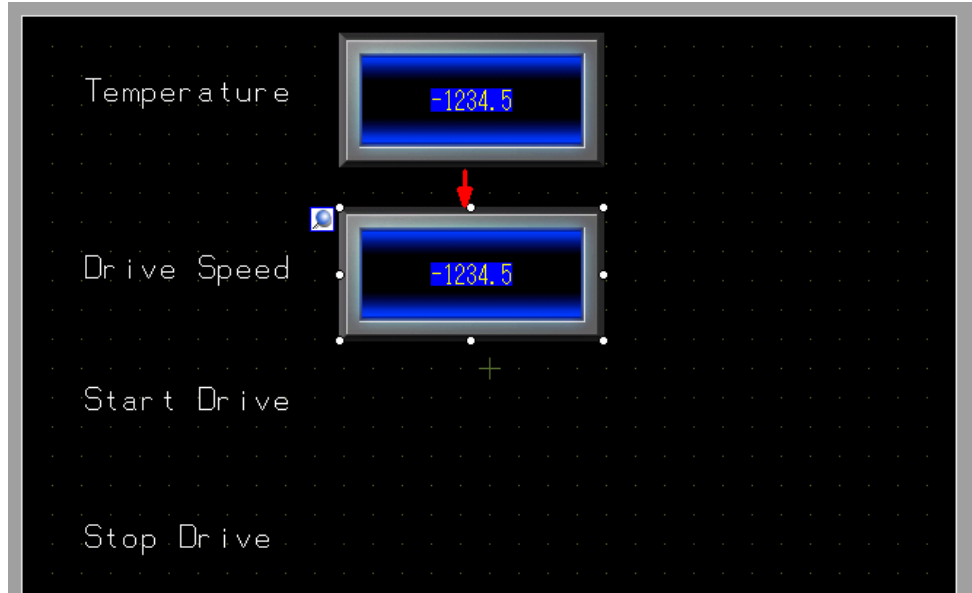   iii. From the **Data Type** drop-down list, select **32 Bit Float**.

d. Click the **Display** tab and set the **Decimal places** field to **1**; then, click **OK**.

e.   Copy the **Data Display** element next to **Temperature** and paste it next to **Drive Speed**.

f.   Click the icon next to the **Monitor World Address** and change the tag name to **DisplaySpeed**.
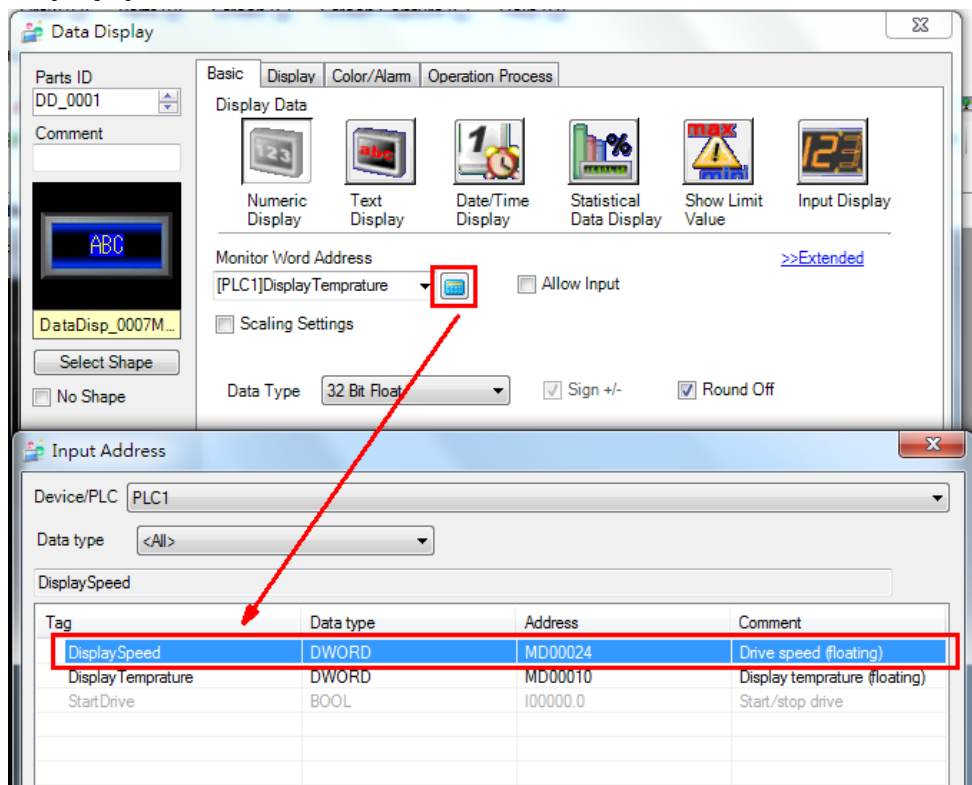
g. In the **Parts Toolbox** pane, select **Switch** from the **Parts** drop-down list and drag a Switch element next to **Start Drive** and **Stop Drive**. Then, change the color of the Switch element for Start Drive to green.
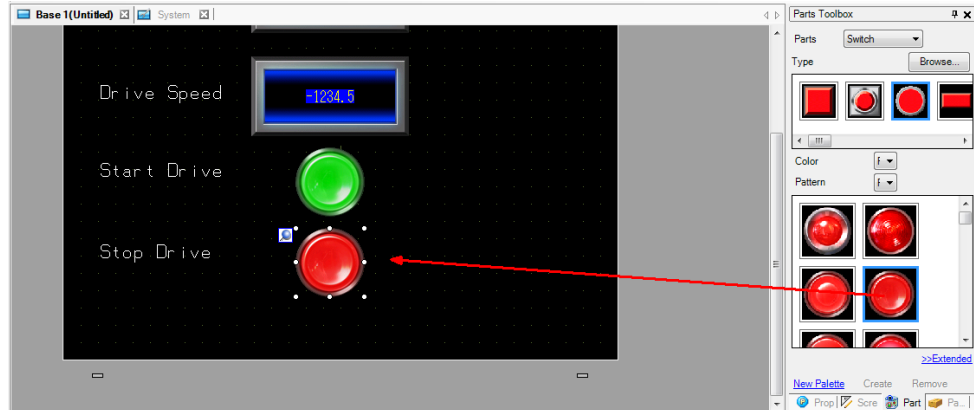

h. Double-click the Start Drive Switch element to configure its properties.

In the **Switch Feature** tab, configure the following fields and click **OK**:

- **Bit Address:** Select **StartDrive** from the drop-down list.
- **Bit Action:** Select **Bit Set** from the drop-down list.
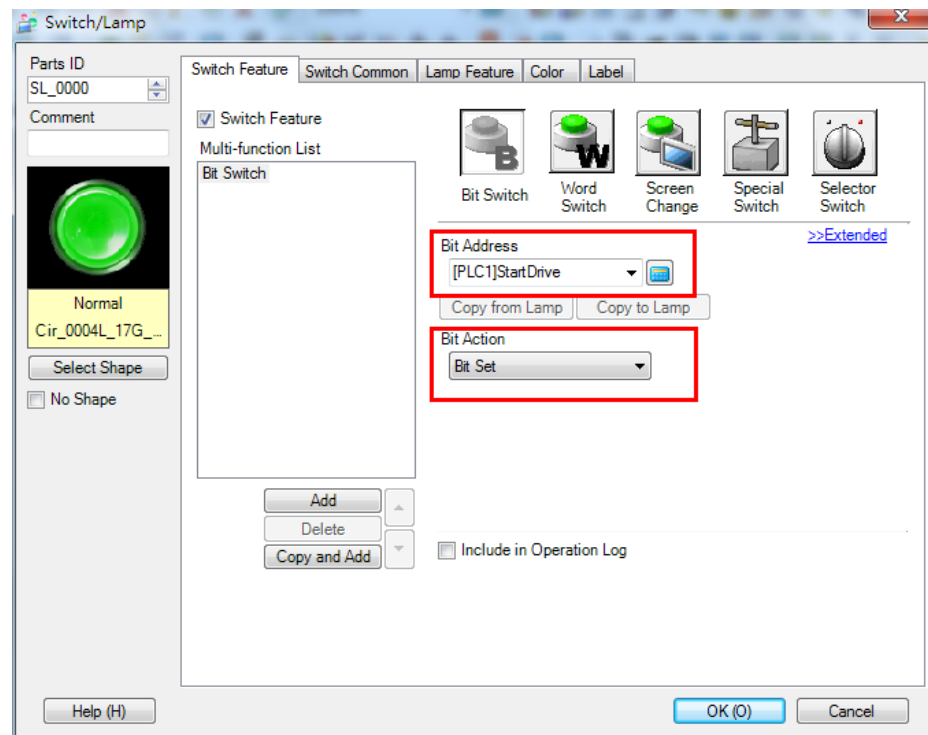
i. Double-click the Stop Drive Switch element to configure its properties.

In the **Switch Feature** tab, configure the following fields and click **OK**:

- **Bit Address:** Select **StartDrive** from the drop-down list.
- **Bit Action:** Select **Bit Reset** from the drop-down list.
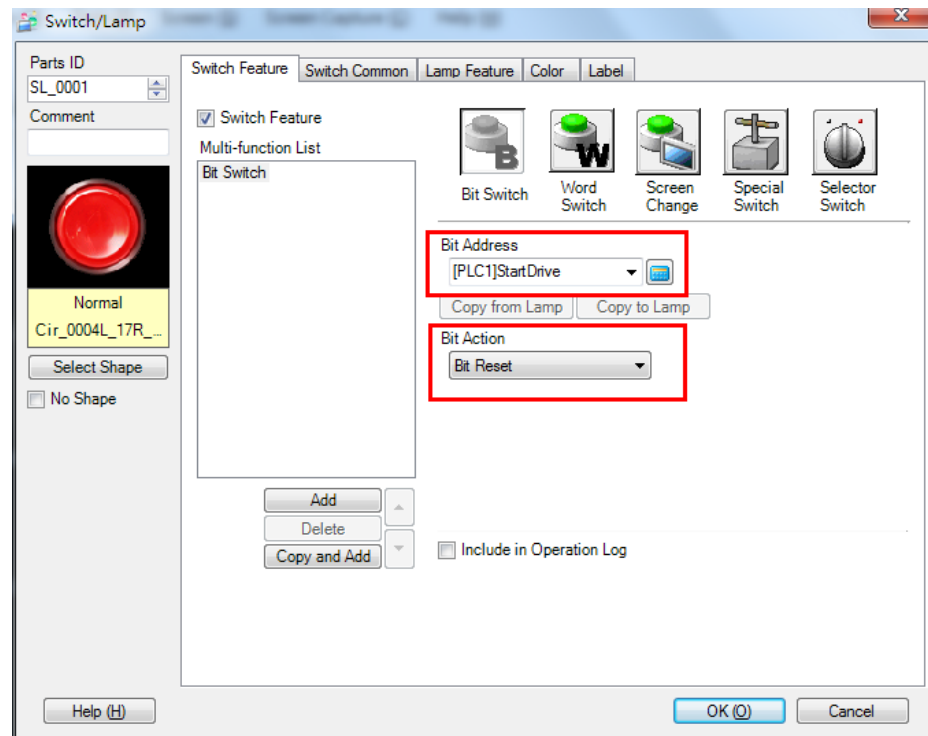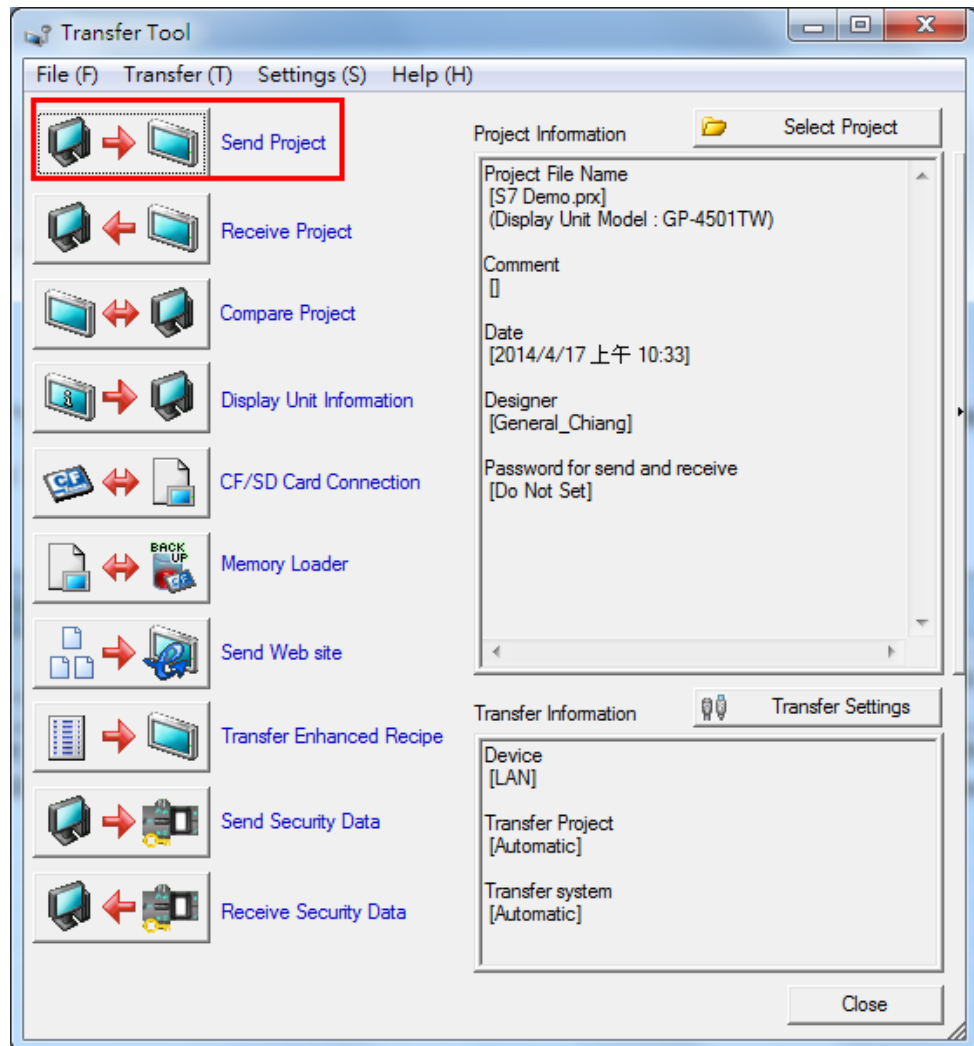

4. **Transferring a Project**

After you edit a screen, save the project.

a. Click **Transfer Project** to transfer a project to Pro-face GP-4501TW.
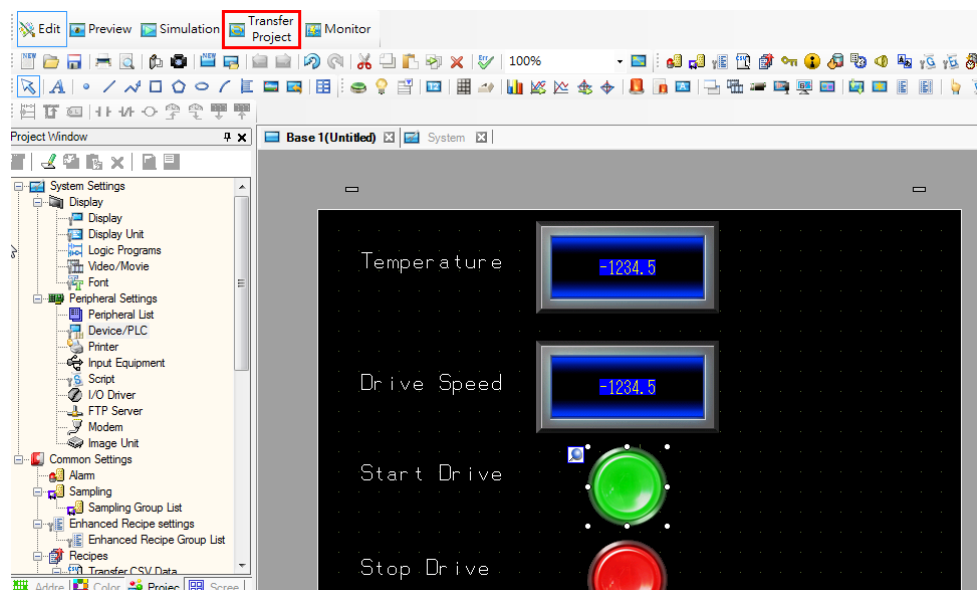
b. In the **Transfer Tool** window, click **Send Project**.

c. The **Select Display Unit** window displays the list of online Pro-face HMI devices. Select to enable the Pro-face GP-4501TW device and click **OK** to transfer the project.
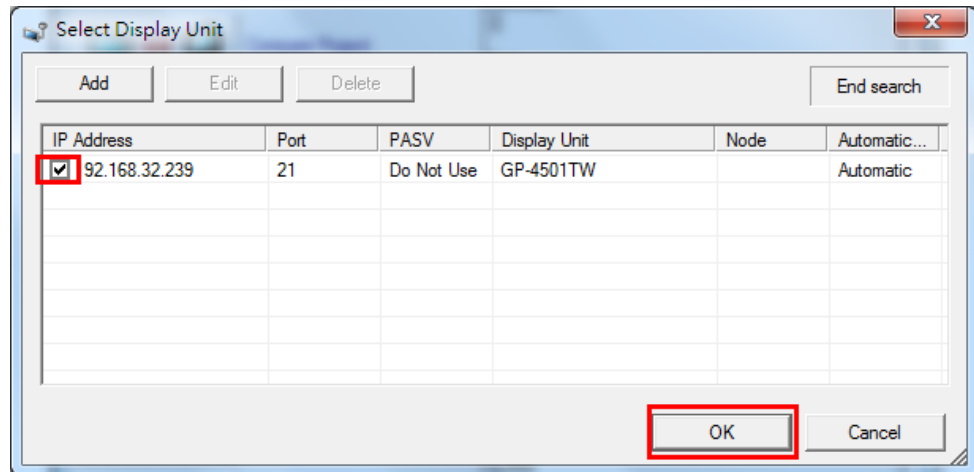
5 On-line Test

The Pro-face GP-4501TW panel displays **Temperature** (in degree Celsius) that is read from IAQPoint2 and **Drive Speed** from Power Flex 4M.

Drive Speed is 0.0 because PowerFlex 4M is in Stop Mode.

Click the Switch element for the Start Drive to set the StartDrive tag. PowerFlex 4M is now in Start Mode and Drive Speed is greater than 0.0 as shown in the following figure.