How to Configure Pro-face HMI with Allen-Bradley PLC

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About Moxa

Moxa is a leading manufacturer of industrial networking, computing, and automation solutions. With over 25 years of industry experience, Moxa has connected more than 30 million devices worldwide and has a distribution and service network that reaches customers in more than 70 countries. Moxa delivers lasting business value by empowering industry with reliable networks and sincere service for automation systems. Information about Moxa’s solutions is available at www.moxa.com. You may also contact Moxa by email at info@moxa.com.

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1 Application Description

- **Objective**
  This document describes how to use Pro-face GP-4501TW to control and monitor Allen-Bradley 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 the Pro-face HMI to control and monitor Allen-Bradley PLC.

2 System Topology

The following figure shows the system architecture in which Modbus end devices, PowerFlex 4M and IAQPoint2, are connected to the serial port on MGate 5105-MB-EIP through RS-485-2W wiring. MGate 5105-MB-EIP, PC that hosts RSLogix 5000, Allen-Bradley ControlLogix PLC, and Pro-face GP-4501 TW which is a HMI device that controls and monitors PLC are connected to the Ethernet network. A fan is connected to PowerFlex 4M that outputs electric current to power the fan. Pro-face GP-4501TW controls and monitors the Allen-Bradley PLC via the Ethernet.
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 that displays the user interface.

B. For information on other hardware requirements, refer to the Configuring Allen-Bradley ControlLogix PLC with Moxa MGate 5105-MB-EIP.

3.2 Software Requirement

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 Allen-Bradley ControlLogix PLC with Moxa MGate 5105-MB-EIP.

4 Configuration

4.1 Hardware Installation

1. Serial Wiring
   For information on installing PowerFlex 4M and IAQPoint2, refer to the Configuring Allen-Bradley ControlLogix PLC with Moxa MGate 5105-MB-EIP.

2. Ethernet Connection
   Connect all of Ethernet ports on each device to a switch.
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.

\textbf{Note:} Do not touch both corners at the same time.

\begin{itemize}
  \item Touch \textit{Offline}.
  \item Touch \textbf{Main Unit Settings} \rightarrow \textbf{Ethernet Local Settings}.
\end{itemize}
d. Configure the IP address and Subnet Mask fields.

4. For information on other hardware settings, refer to the Configuring Allen-Bradley ControlLogix PLC with Moxa MGate 5105-MB-EIP.

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.

![Display Unit Configuration](image)

b. In the Device/PLC screen, configure the following fields and click New Screen:
   - **Manufacture:** Select **Rockwell Automation Inc.** from the drop-down list.
   - **Series:** Select **Ethernet/IP** from the drop-down list.
   - **Port:** Select **Ethernet (TCP)** from the drop-down list.

![Device/PLC Configuration](image)
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.
The **PLC1** settings screen appears.

![Individual Device Settings](image)

- **Series:** Select Control/Compact/Flex Logix Series Native from the drop-down list.
- **IP Address:** Enter the IP address.
- **Slot Number:** Type "0".

In the PCI settings screen, configure the following fields and click **OK**:

![Individual Device Settings](image)
d. Before you can import tags, you must export tags from the RSLogix 5000 project.
   i. Open the Demo project in RSLogix 5000 (for more information, refer to the
      Configuring Allen-Bradley ControlLogix PLC with Moxa MGate 5105-MB-EIP).
   ii. Right-click Controller Tags and select Export Tags.
   iii. Save the file using the file name “Demo-Controller-Tags.CSV”.

e. In the PLC1 settings screen, click Import New.
f. In the Select File to Import From screen, select CSV files (*.csv) from the File Type drop-down list and click Browse to select a tag file. Then, click Open.

![Select File to Import Tags From]

After the tag file is imported, the Tag Data field shows the exported file name in the PLC1 settings screen. Click OK.

![Individual Device Settings]

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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.

   ![Image showing Text Object creation](image1.png)

   b. In the Parts Toolbox pane, select Meter Graph from the Parts drop-down list and drag a meter element to the screen next to Temperature.

   ![Image showing Meter Graph element placement](image2.png)

   c. Double-click the Meter Graph element to configure its properties.
d. Click the icon next to the **Monitor Word Address** field and select the **temperatureReal** tag. Then, click **ENTER**.
e. In the Basic tab, configure the following fields and click OK:
   - **Data Type**: Select **32 Bit Float** from the drop-down list.
   - **Source Range**: Set the **Min** and **Max** fields to "0" and "50" respectively.

f. From the Parts Toolbox pane, drag the **Data Display** element to the screen next to **Running Speed**.

g. Double-click the **Data Display** element to configure its properties.
h. Click the icon next to the **Monitor Word Address** field and select the **speedReal** tag. Then, click **ENTER**.

i. From the **Data Type** drop-down list, select **32 Bit Float**.
j. Click the **Display** tab and set the **Decimal places** field to **1**.

k. Copy the **Data Display** element next to **Running Speed** and paste the element next to **Modify Speed**.
1. Click the icon next to the **Monitor Word Address** field and change name of the tag to **outSpeedReal**. Then, click **ENTER**.

m. Select the **Allow Input** checkbox. This enables you to configure PLC.
n. From the Parts Toolbox pane, select Switch from the Parts drop-down list and drag a Switch element next to Manual On and Manual Off. Then, change the color of the Switch element for Manual On to green.

o. Double-click the Manual On Switch element to configure its properties. In the Switch Feature tab, configure the following fields and click OK:

- **Bit Address**: Select byManual from the drop-down list.
- **Bit Action**: Select Bit Set from the drop-down list.
How to Configure Pro-face HMI with Allen-Bradley PLC

p. Double-click the Manual Off Switch element to configure its properties. In the Switch Feature tab, configure the following fields and click OK:

- **Bit Address**: Select by Manual 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**.

![Transfer Tool window]

```
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.

![Select Display Unit window]

```
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 Online Test

The Pro-face GP-4501TW panel displays the temperature (in degree Celsius) that is read from IAQPoint2 and the running speed from Power Flex 4M. The running speed is controlled by Allen-Bradley when the `byManual` tag is set to `Reset`.

Click the Modify Speed Data Display element to display a number keypad as shown in the following figure. Enter “50.0” and click `ENT`. The Modify Speed field displays 50.0.

Double-click the Switch element for Manual On and change the `byManual` tag to `Set`. In the case, the Running Speed field displays 50.0.