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

Moxa Technical Support Team <u>support@moxa.com</u>

Contents

1	Application Description	2
2	System Topology	2
3	Hardware and Software Requirements	3
3.1	Hardware Requirement	
3.2	Software Requirement	
4	Configuration	3
4.1	Hardware Installation	
4.2	Configuring GP-Pro EX	5
5	Online Test	

Copyright © 2014 Moxa Inc.

Released on December 19, 2014

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.

How to Contact Moxa

Tel: +886-2-8919-1230 Fax: +886-2-8919-1231



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

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.



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

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-Brandly 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 $\ensuremath{\mathsf{V3.5}}$

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

2. Ethernet Connection

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



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

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.

	Settings	Peripheral Settings	Password Settings	Initialization Menu
Maintenance Menu	Transfer	External file operation		
	Screen Settings		System Area Se	ettings
Op	eration Settings		Ethernet Local	Settings
D	isplay Settings		Logic Setti	ngs
Menu	and Error Setting	s	Extended Set	tings
1	Window Settings		Remote Viewer S	Settings

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

	Operation Settings						
System Area Settings	Ethernet Local Settings	Logic Settings		Extende Setting	d IS		
Local Name:							
IP Address:			192	168	32		239
Subnet Mask:		Γ	255	255	25	2	0
Port:							8000
Gateway:		Γ	192	168	35		254
MAC Address:		Γ	00	01 23	1F	F3	BC
Auto Recognit	ion:	•	Enab	le	• D	isable	
Speed Settings:					01	BM	
Duplex Settin	gs:	(
	Frit			Back		201	4/04/16

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

4. For information on other hardware settings, refer to the *Configuring Allen-Brandly 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. Welcome to GP-Pro EX

67-7ro EX	New Create Project From Sample Active_Alam_Detail_Block.px Alam_History_Display.ppx	_
	Copen Existing Project Open Recent Project	T
	NativeTest.prx ControlLogix.prx S7Demo.prx 4501test.prx	
	OK (0)	Cancel

Copyright $\ensuremath{\mathbb{C}}$ 2014 Moxa Inc.

X

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

- 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				
62-2co DX	Series	GP4000 Series			•
		GP-45** Series			•
	Model	GP-4501TW			•
	Orientation	Landscape 🔻			
	Specifications				
	Screen Size	10.4 inch			
	Resolution	640 x 480 pixels (VGA)			
	Display Unit	TFT Color LCD			
	Display Colors	65,536 Colors			
	Touch Panel	Analog			
	Internal Memory	16 MB			
	Backup Memory	128 KB			
	COM1	RS-232C			
	COM2	RS-422(RS-485)			
	USB(A)	1 Ports			
	USB(mini-B)	1 Ports			
	LAN	1 Ports			
	SD	On			
	Video Input	None			
	Internal Board	None			
			Back (B)	Next (N)	Cancel

- d. 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.

🚰 Welcome to GP-Pro EX		
	evice/PLC	
	umber of Devic	
		Device/PLC 1
M	lanufacturer	Rockwell Automation, Inc.
S	eries	EtherNet/IP
	ort	Ethernet (TCP)
		Refer to the manual of this Device/PLC
		Recent Device/PLC
		F
	Use System	Area <u>Device Information</u>
	Back (B)	Communication Settings New Logic New Screen Cancel

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

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.



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

The **PLC1** settings screen appears.

撞 Individ	ual Device	Settings	5			x
PLC1						
Series	SLC500 Se	ries				•
(Please r if you hav	econfirm all ve changed t	address the series	settin <u>c</u> .)	is that	you are	using
IP Addres	s	0.	0.	0.	0	
		OK	(0)		Cance	el

- c. In the PCI settings screen, configure the following fields and click $\ensuremath{\textbf{OK}}$:
 - Series: Select Control/Compact/Flex Logix Series Native from the drop-down list.
 - **IP Address:** Enter the IP address.
 - Slot Number: Type "0".

🖆 Individual Device Settings				
PLC1				
Series Control/Compact/Flex Logix Series Native				
Comp	actLogix Direct Connection			
(Please reconfirm all address settings that you are using if you have changed the series.)				
IP Address	192. 168. 32. 231			
Slot Number	v 0			
Tag Data				
	Import New Edit			
	OK (O) Cancel			

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

- 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-Brandly 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".

RSLogix 5000 - Demo [1756-L71 20.12] - [Contro	ler Tags - 🛙	Demo(controller)]	Concernation of the	Inades P.C Application Pages	STATISTICS.	and the second		
File Edit View Search Logic Communic	ations To	ools Window Help						
Mine 0. FRUN V6Fraces > 0.0 Bergery Strage 0.0 Redundrero 4 How To Bergery Strage 0.0 Constrainting 4 Constrainting 4 Constrainting 4 Constrainting 4								
Controller Organizer	- # ×	Scope: Demo 👻	Show: All Tags	X X		 Y. Enter N. 	ama Filter	X X
E Controller Demo		Name 💷 🛆	Alias For Ba	ise Tag Data Type	Description	External Access	Constant	Style
Controller Lacon New Tag Ct	l+w	byManual		BOOL		Read/Write		Binary
Controller Pa Power-Lip He		+ MGate5105/I		_03DF:MGate_D		Read/Write		
A Tasks		+ MGate5105:0		_03DF:MGate_7		Read/Write		
🖶 🙀 MainTask Edit Tags		outSpeedReal		REAL		Read/Write		Float
MainProgVerify		speedReal		REAL		Read/Write		Float
- Unscheduled Export Tags		temperatureReal		REAL		Read/Write		Float
🖨 🔄 Motion Groups		2						
Ungrouped A Print								
Data Types								
Chinese								
Add-On-Defined								
Redefined								
Module-Defined								

e. In the PLC1 settings screen, click **Import New**.

🖆 Individual Device Settings 🛛 💌			
PLC1			
Series Control/Co	Series Control/Compact/Flex Logix Series Native		
(Please reconfirm all address settings that you are using if you have changed the series.)			
IP Address	192. 168. 32. 231		
Slot Number	0		
Tag Data			
	Import New Edit		
	OK (O) Cancel		

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

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.

撞 Select File to	Import Tags Fron	n	-		×
搜尋位置(l):	🌗 AB		- 6	• 🖅 对 🗊	
Ca	名稱	*		修改日期	類型
★ 最近的位置	🔽 🖺 Demo-Co	ontroller-Tags.CSV		2014/4/11下4	= 03:55 Micros
桌面					
媒體櫃					
電腦					
網路	•				Þ
	Tag/Structure	[Import All	Force In-Us	æ Tags Update	
	📝 Controller Scop	e Only	Create Cust	om String Structur	9
	檔案名稱(N):	Demo-Controller-Tag	ECSV	•	開設舊檔(())
	檔案類型(I):	CSV files (*.csv)		-	取消
	Delimiter Setting:	Comma	•		.4

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

🚔 Individual Device	e Settings
PLC1	
Series Control/Co	mpact/Flex Logix Series Native
(Please reconfirm al if you have changed	I address settings that you are using the series.)
IP Address	192. 168. 32. 231
Slot Number	0
Tag Data	Demo-Controller-Tags 🔹 🔻
	Import New New Edit
	OK (0) Cancel

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

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 **Meter Graph** from the **Parts** drop-down list and drag a meter element to the screen next to **Temperature**.



c. Double-click the **Meter Graph** element to configure its properties.

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

d. Click the icon next to the **Monitor Word Address** field and select the **temperatureReal** tag. Then, click **ENTER**.

🚔 Graph	22
Parts ID	Basic Color Scale
GR_0000 🚔	Graph Type
Comment	
	Normal Graph Statistical Graph Meter Graph
₹ ₹	Monitor Word Address [PLC1]temperatureReal
MT PL001	Pinput Address
Select Shape	Device/PLC PLC1
	temperatureReal
Help (H)	- byManual - outSpeedReal - speedReal - temperatureReal
Ma	
F3 F4	
. 86) [114x58]	Set as Default Value

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

- 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.

撞 Graph	ine () Ant () Lever () Lever (anter () ant ()
Parts ID GR_0000	Basic Color Scale Graph Type Mormal Graph Statistical Graph Meter Graph Monitor Word Address [PLC1]temperatureReal •
MT_PL001 Select Shape	Jata Type 32 bit Hoat Source Range Display Range Min. 0 Max. 50 Display Direction Rotate Richt
Help (H)	OK (0) Cancel

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

🔲 Base 1	I(Untitled) 🛛 🖬 System		⊳	Parts Toolbo	ж Р Х
			-	Parts	Data Display 🔻
	-	-		Туре	Browse
	Temperature			_	
		Σ. Σ			
				Color	E 💌
			Ε		
	Runni ng Speed				
					1
	Modify Speed				Ξ.
				+	
					÷
					>>Extended
				New Palette	Create Remove
	Manual On		Ŧ	🕝 Prop 🛛	🗸 Scre 👸 Part 🥑 Pa

g. Double-click the **Data Display** element to configure its properties.

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

h. Click the icon next to the **Monitor Word Address** field and select the **speedReal** tag. Then, click **ENTER**.

Data Display		-	-			X
Parts ID DD_0000	Basic Display Color/Alam C Display Data Image: Display Data Numeric Text Display	Deration Process	Statistical Data Display	Show Limit Value	Input Display	
ABC	Monitor Word Address [PLC1]temperatureReal	AI	ow Input		>>Extended	
Device/PLC PLC1 speedReal			•	Round Off		
byManual outSpeedReal speedReal temperatureRea						
	\mathbf{X}					
Array Element	Bit	•	_	OK (0)	Cancel	
0 🔹 0		ENTE	R s P	art F7 Nex	t Drawing F8	Pre

i. From the **Data Type** drop-down list, select **32 Bit Float**.

🖆 Data Display	
Parts ID	Basic Display Color/Alam Operation Process
DD_9998 🚔	Display Data
Comment	
	Numeric Text Date/Time Statistical ShowLimit Input Display Display Display Display Data Display Value
ABC	Monitor Word Address [PLC1]speedReal Allow Input
DataDisp_0009M	Scaling Settings
Select Shape	
No Shape	Data Type 32 Bit Float ▼ Sign +/- ▼ Round Off
	Include in Operation Log
Help (H)	OK (0) Cancel

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

🍃 Data Display	
Parts ID	Basic Display Color/Alam Operation Process
DD_9998 🚔	>>Extended
Comment ARC	Font Font Type Standard Font Size 8 x 16 Pixels Text Attribute Normal
DataDisp_0009M Select Shape	Total Display Digits Decimal Place Value Decimal Places 5 Image: Constant in the second secon
	Image: Construction Image: Construction Image: Constretion Image: Construction
	7-segment Display -1234.5 Auto-size Font Hide Input Value (Show asterisks)
Help (H)	OK (0) Cancel

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**.



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

 Click the icon next to the Monitor Word Address field and change name of the tag to outSpeedReal. Then, click ENTER.

1	🖆 Data Display							X
	Parts ID	Basic Display	Color/Alarm	Operation Proces	s			
	DD_0000	Display Data						
	Comment	123	abo	10	h%	—	I2∄	
		Numeric Display	Text Display	Date/Time Display	Statistical Data Display	Show Limit Value	Input Display	
	ABC	Monitor Word A	ldress al ▼		Allow Input		>>Extended	
	DataDisp_0009M	🖆 Input Address	3	<u> </u>		×		
	Select Shape	Device/PLC PLC				•	1	
	No Shape	outSpeedReal						
		www.byManual woutSpeedReal wspeedReal						
			~ \					
				\backslash				
					\mathbf{x}			
					\mathbf{n}			
	Help (H)	Array Element			Bit		Cancel	
2	_		÷ 0	A Y	-	ENTER		_

m. Select the **Allow Input** checkbox. This enables you to configure PLC.

🍰 Data Display			wa 1/ 3 - 1/alia /1/				x
Parts ID	Basic Display Display Data	Color/Alarm	Operation Process	Data Entry			
Comment	23	aba	10	}	*	12]]	
	Numeric Display	Text Display	Date/Time Display	Statistical Data Display	Show Limit Value	Input Display	
ABC	Monitor Word Ac	ldress				>>Extended	
	[PLC1]outSpeed	Real 🔻	· 🔜 🛛 🔽 All	ow Input			
DataDisp_0009M	Scaling Setti	ngs					
Select Shape No Shape	Data Type	32 Bit Float	▼	Sign +/-	Round Off		

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



- 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 by Manual from the drop-down list.
 - **Bit Action:** Select Bit Set from the drop-down list.

撞 Switch/Lamp	21 100 H	
Parts ID SL_0000	Switch Feature Switch Common	Lamp Feature Color Label
Comment Comment	✓ Switch Feature Multi-function List Bit Switch	Bit Switch Word Switch Screen Change Special Switch Selector Switch Bit Address Screen Change Special Switch Selector Switch Selector Switch Bit Address Screen Change Screen Change Special Switch Selector Switch Bit Address Screen Change Screen Change Screen Change Screen Change Selector Switch Bit Address Screen Change Screen Change Screen Change Screen Change Screen Change Bit Address Screen Change Screen Change Screen Change Screen Change Screen Change Bit Address Screen Change Screen Change Screen Change Screen Change Screen Change Bit Address Screen Change Screen Change Screen Change Screen Change Screen Change Bit Address Screen Change Screen Change Screen Change Screen Change Screen Change Bit Address Screen Change Screen Change Screen Change Screen Change Screen Change Bit Action Screen Change Screen Change Screen Change Screen Change Screen Change
	Add Add Copy and Add	Include in Operation Log
Help (H)		OK (0) Cancel

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

Switch/Lamp					×
Parts ID SL_0001	Switch Feature Switch Common	Lamp Feature Color La	abel		
Comment Comment Normal Cir_0002L_17R Select Shape No Shape	Switch Feature Multi-function List Bit Switch	Bit Switch Bit Switch Bit Address [PLC1]byManual Copy from Lamp	h Screen Change	Special Switch	Selector Switch
	Add Add Copy and Add	Include in Operation	Log		
Help (H)				DK (O)	Cancel

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.

🚔 GP-Pro EX	holder of \$1000 to the bady hit had able to the bady here had an inclusion of the
Project (F) Edit (E) View (V) Common Se	ttings (R) Draw (D) Parts (P) Screen (S) Screen Capture (C) Help (H)
🔆 Edit 💽 Preview 🔝 Simulation 💽 Transfer	Monitor
: 🖤 🗁 🔒 🚔 🔯 🏚 🚳 🔛 🙀 🚔	। 🖓 🔃 😹 🖳 🐘 🕸 🗶 🖅 100% 🔹 🛛 🖬 🛃 🛃 🖓 👘 🖬 🚯 🖓 🐜 🚱 🖓 🦉 🥳 🖗
$ \mathbf{A} \circ / \checkmark \Box \Diamond \circ / \blacksquare \Box \blacksquare$	a 🗄 👄 ♀ 🖆 🔤 🏙 🎿 🌆 🖄 🖄 🛧 🔶 🚨 🧓 🔤 🚽 🏪 🛥 📭 🖳 📾 🕼 💷 🧯 🧕
◎四日 41 47 0 9 9 9 9 9 9 9 1 1 1 1 1 1 1 1 1 1 1 1	
Screen List 7 X	tase 1 (Untitled) 🖾 📑 System 🖾
Screens of Type All 👻	
Search Method Title -	Running Speed
Refine Search Search	
🎬 🛍 🗓 🗙 🚊 🎒 💺	and the second
🚱 Base Screens	Modify Speed
B0001	
🚱 Window Screens	
🚱 Keypad screen 😑	
🚱 Image Unit Window screen	Mariual On the transformation of the transfo
S Logic Screens	
-INIT	
	Manual Off

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

Transfer Tool						
File (F) Transfer (T) Settings (S) Help (H)						
Send Project	Project Information 📴 Select Project					
Receive Project	Project File Name [AB Demo.prx] (Display Unit Model : GP-4501TW)					
Compare Project	Comment D Date [2014/4/16 下午 04:38]					
Display Unit Information	Designer [General_Chiang]					
CF/SD Card Connection	Password for send and receive [Do Not Set]					
Memory Loader						
Send Web site	× ×					
Transfer Enhanced Recipe	Transfer Information					
Send Security Data	Transfer Project [Automatic]					
Receive Security Data	Transfer system [Automatic]					
	Close					

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.

😭 Select Display Unit					×
Add Edit	Del	ete			End search
IP Address	Port	PASV	Display Unit	Node	Automatic
92.168.32.239	21	Do Not Use	GP-4501TW		Automatic
1					
				ок	Cancel

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

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.

Modify Speed	0.0	50.0					
		•		CLR	CAN	CEL	
		7	8	9	BS		
anual On		4	5	6	DEL	V	
Manual Off		1	2	3	+	E	
		()		-	T	

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.

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



Copyright © 2014 Moxa Inc.

Page 21 of 21