

Application Note

Configuring a Pro-face HMI to communicate with an MP2000iec controller over MODBUS/TCP

Applicable Product: MP2000iec controller

Subject: Application Note	Product: MP2000iec	Doc#: AN.MCD.09.124
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Application Overview

This application note describes the steps needed to configure a Pro-face HMI to communicate with an MP2000iec controller over MODBUS TCP. The set up steps for the two devices, HMI and the MP2000iec controller are shown in detail in this note.

Application Highlights:

- Industry: Automation
- Major Features: Quick and easy set up for communication using MODBUS/TCP

Products Used:

Component	Product and Model Number
Controller	MP2000iec
Software	MotionWorks IEC Express
HMI	Pro-face AGP3650

Application Hardware

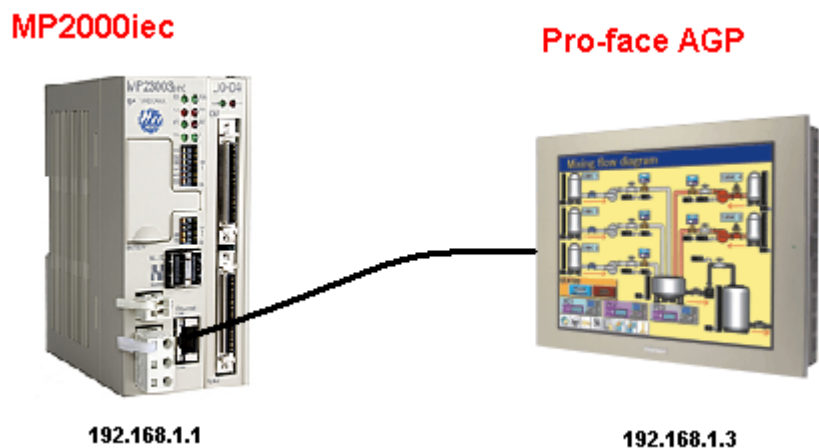


Figure 1: Hardware

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Implementation Method of Core Operation

In order to set the HMI as a MODBUS client, select the manufacturer to be Schneider Electric so that the MODBUS TCP Master driver can be activated. The IP address of the MP2000iec controller is set up in this section as well. In this example, the IP address of the HMI is 192.168.1.3 and the controller IP address is 192.168.1.1

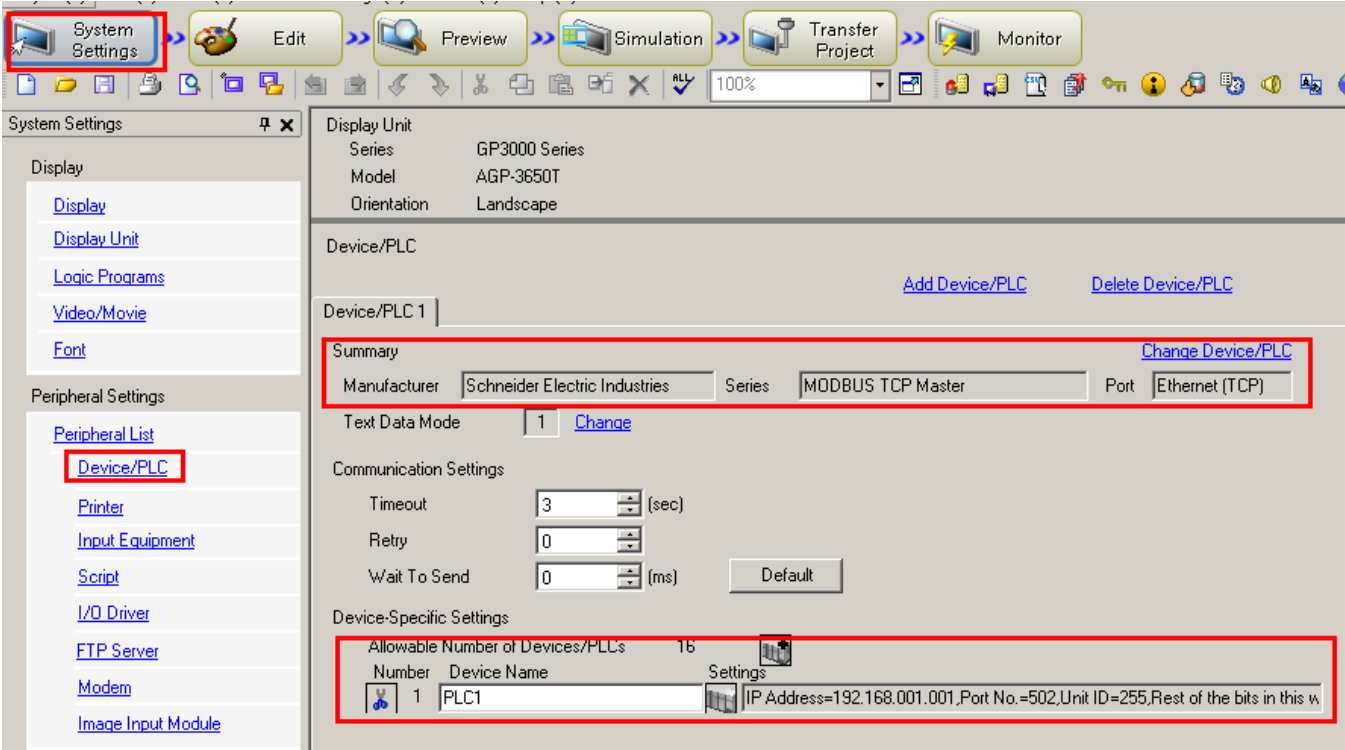


Figure 2: Configuration of Pro-face as MODBUS master

Set up the user interface and variables on the HMI side. An example is shown in Figure 3.

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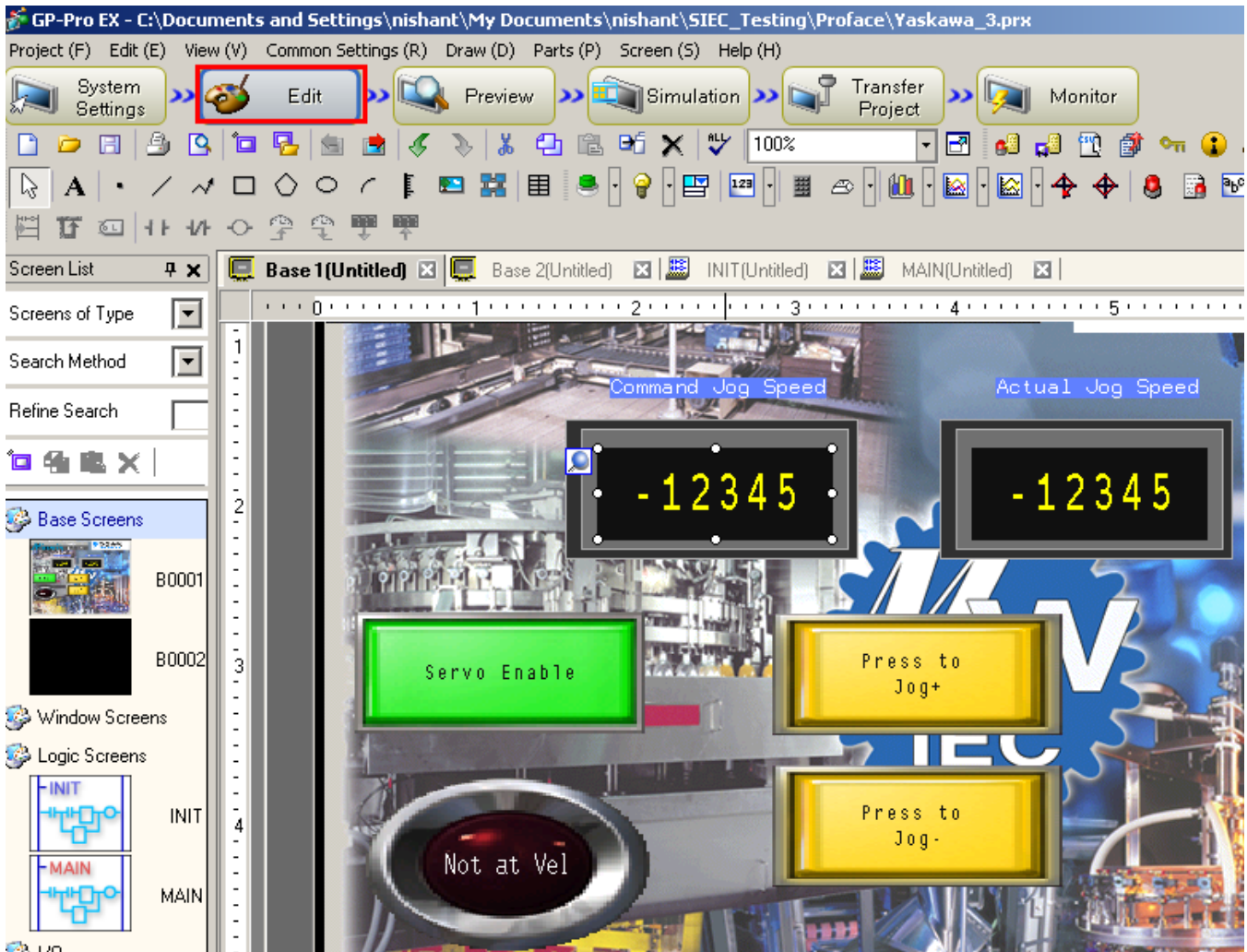


Figure 3: User Interface set up

Configure the variables such that the appropriate MODBUS addresses are allocated to the variables. Two such variable configurations are shown in figures 4 and 5. Figure 4 is an example of a coil set from the HMI. Figure 5 is an example of a 32 bit floating point data type used to send commanded speed to the MP200iec controller.

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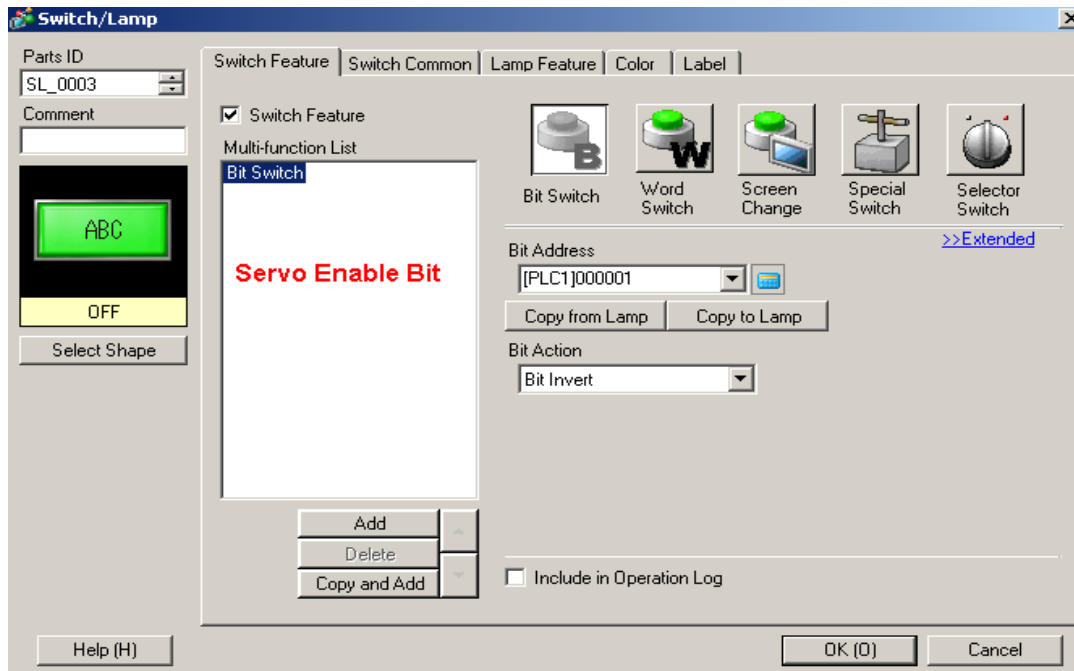


Figure 4: Set coil using FC 5

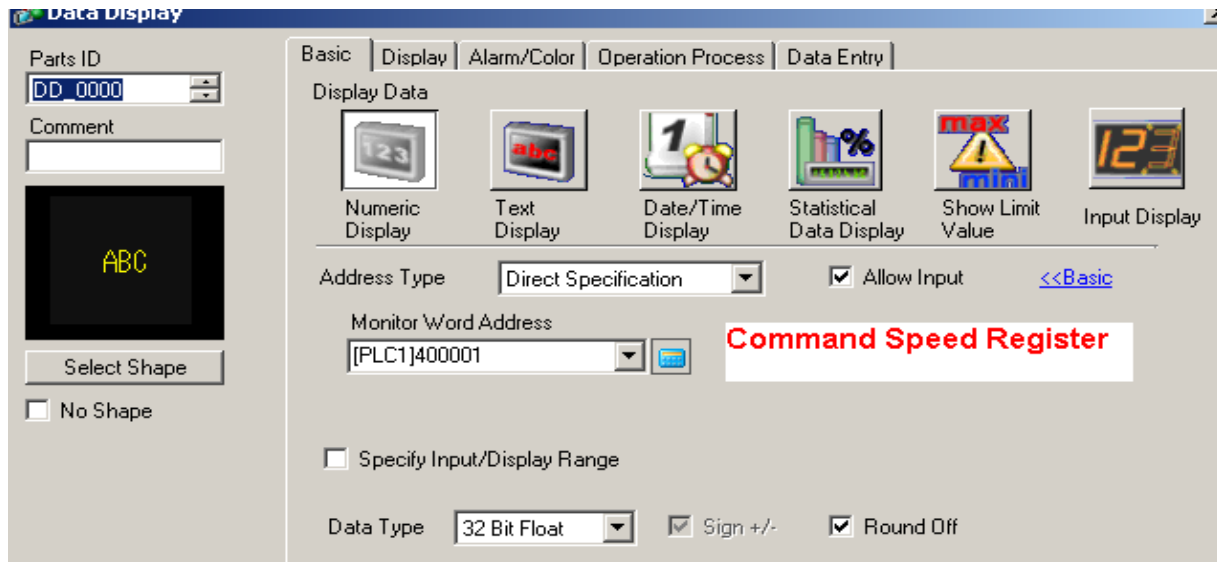


Figure 5: Setting up floating point data (FC 6/16)

Figure 6 is an illustration of the various function codes supported by the MP2000iec controller when it is used as

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a server in MODBUS protocol. This diagram will be useful in planning variables before setting them up in the MP controller.

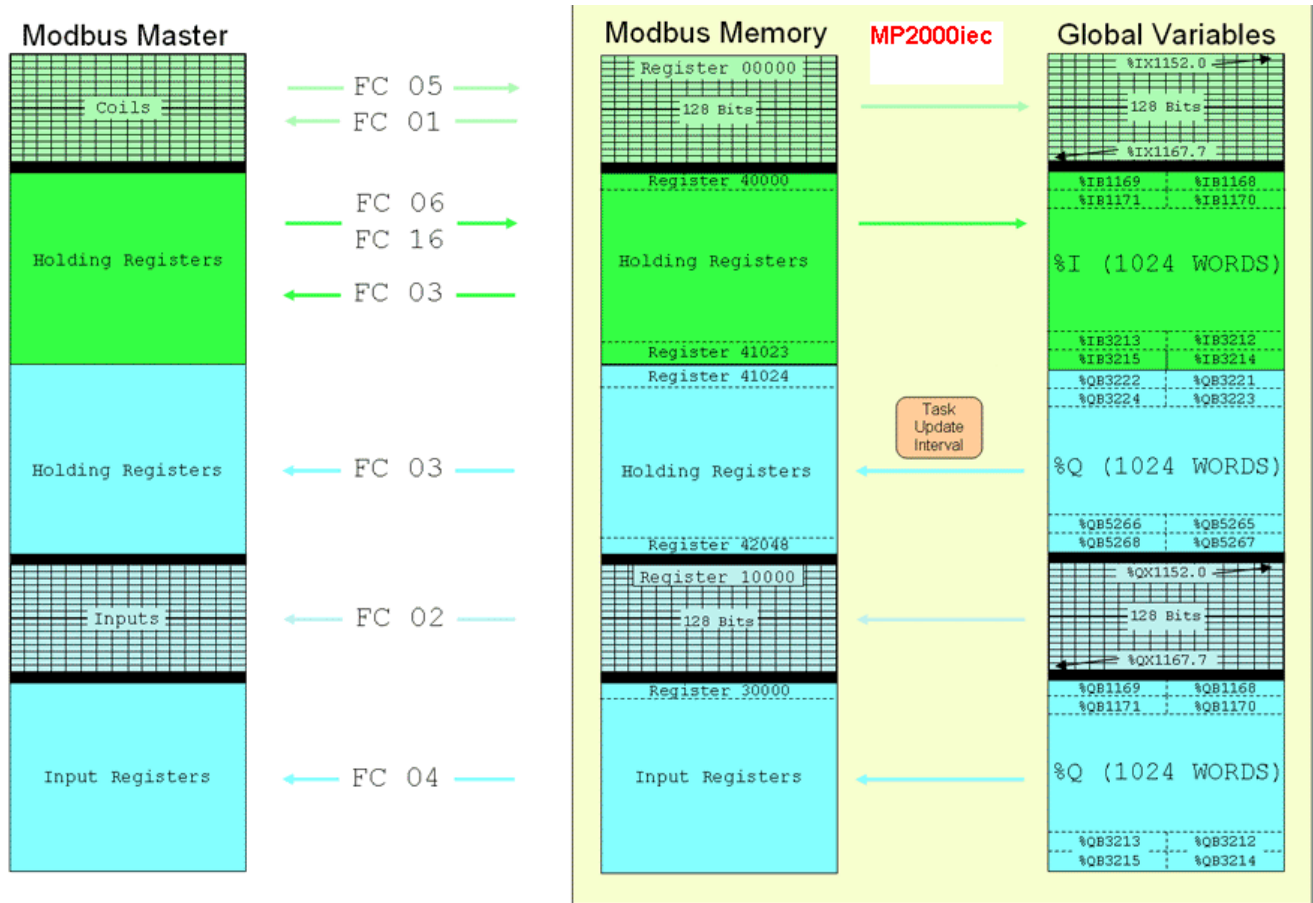


Figure 6: Supported function codes when the MP2000iec is a MODBUS server

To set up the MP2000iec controller as a server, open the Configuration tool. Once online with the controller, click the MODBUS option under the hardware tree. Select the option such which makes the controller a MODBUS server (Figure 7). Save the configuration. Cycle power on the whole system. The various MODBUS groups and the addresses of the groups can be seen in the global variables worksheet as shown in Figure 8.

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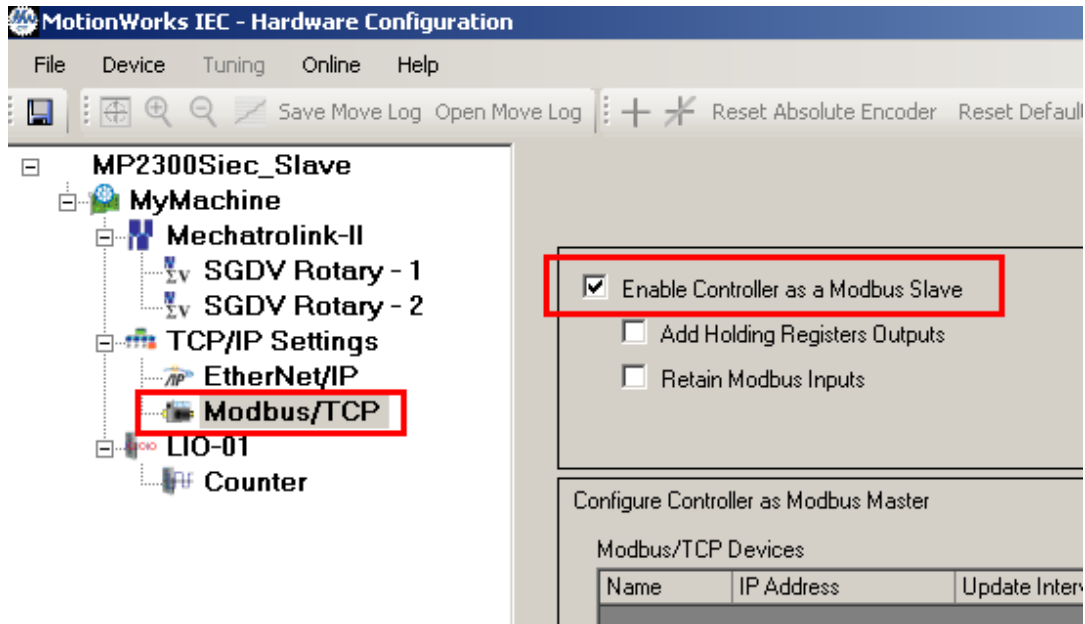


Figure 7: Hardware configuration on MP2000iec

+	Modbus FC#05 Qty: 128 Coils, Address Range: %IX4.0 - %IX19.7
+	Modbus FC#02 Qty: 128 Inputs, Address Range: %QX2.0 - %QX17.7
+	Modbus FC#04 Qty: 1024 Input Registers, Address Range: %QB18 - %QB2065
+	Modbus FC#06,16 Qty: 1024 Registers, Address Range: %IB20 - %IB2067

Figure 8: MODBUS groups in MotionWorks IEC

Create variables on the MP2000iec side and assign them addresses as per the group addresses that got created when the MP2000iec was configured as the MODBUS server

In this example, the various variables chosen are:

<u>HMI Variable</u>	<u>MODBUS address</u>		<u>Function Code</u>		<u>MP address</u>	<u>MP2000iec variable</u>
Servo Enable	000001	→	FC 5	→	%IX4.0	SV_On_FromHMI
Press to Jog+	000002	→	FC 5	→	%IX4.1	JOG_Plus_FromHMI
Press to Jog -	000003	→	FC 5	→	%IX4.2	JOG_rev_FromHMI
Not at Vel	100001	←	FC 2	←	%QX2.0	ServoJogStatus_toHMI
Command Jog Speed	400001	→	FC 6/16	→	%ID20	JogSpeed_FromHMI
Actual Jog Speed	300001	←	FC 4	←	%QD18	ActualSpeed_ToHMI

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Compile the project. Download the project into the controller and cold start the controller. The program runs and communicates with the Pro-face HMI as can be seen from Figure 9.

Modbus FC#05 Qty: 128 Coils, Address Range: %IX4.0 - %IX19.7					
SV_On_FromHMI	TRUE	BOOL	VAR_GLOBAL		%IX4.0
JOG_Plus_FromHMI	TRUE	BOOL	VAR_GLOBAL		%IX4.1
JOG_rev_FromHMI	FALSE	BOOL	VAR_GLOBAL		%IX4.2
Modbus FC#02 Qty: 128 Inputs, Address Range: %QX2.0 - %QX17.7					
ServoJogStatus_ToHMI	TRUE	BOOL	VAR_GLOBAL		%QX2.0
Modbus FC#04 Qty: 1024 Input Registers, Address Range: %QB18 - %QB2065					
ActualSpeed_ToHMI	1.2017250E+001	REAL	VAR_GLOBAL		%QD18
Modbus FC#06,16 Qty: 1024 Registers, Address Range: %IB20 - %IB2067					
JogSpeed_FromHMI	1.2000000E+001	REAL	VAR_GLOBAL		%ID20

Figure 9: Online values from Pro-face - MP2000iec communication