

## Application Note

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# **How to Retain Modbus/TCP Outputs on a MPiec Controller**

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Subject: Application Note	Product: MPiec Controllers	Doc#: AN.MPIEC.12
Title: How to Retain Modbus/TCP Outputs on a MPiec Controller		

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## Application Overview

This application note describes the requirements to retain Modbus/TCP outputs when using a MPiec controller. Sample programs for the MP2300Siec controller and RedLion HMI are provided. Please note that only clicking the individual variable Retain Column found in the Global Variables list, Figure 1 below, WILL NOT maintain the Modbus/TCP outputs upon a power cycle.

Name	Type	Usage	Description	Address	Init	Retain
Modbus FC#06,16 Qty: 1024 Registers, Address Range: %IB28672 - %IB30719						
Speed	REAL	VAR_GLOBAL		%ID28672		<input type="checkbox"/>
Modbus FC#02 Qty: 128 Inputs, Address Range: %QB24560 - %QB24575						
ServoEnabled	BOOL	VAR_GLOBAL	Servo Is Ready	%QX24560.0		<input type="checkbox"/>
Jogging	BOOL	VAR_GLOBAL	Servo Is Jogging	%QX24560.1		<input type="checkbox"/>
Alarm	BOOL	VAR_GLOBAL	There is an Alarm	%QX24560.2		<input type="checkbox"/>
IndexDone	BOOL	VAR_GLOBAL	Move has completed	%QX24560.3		<input type="checkbox"/>
TurnOnServo	BOOL	VAR_GLOBAL				<input type="checkbox"/>
Out_Bit_00	BOOL	VAR_GLOBAL	MB Output Bit 00	%QX24562.0		<input checked="" type="checkbox"/>
Out_Bit_01	BOOL	VAR_GLOBAL	MB Output Bit 01	%QX24562.1		<input checked="" type="checkbox"/>
Out_Bit_02	BOOL	VAR_GLOBAL	MB Output Bit 02	%QX24562.2		<input checked="" type="checkbox"/>
Out_Bit_03	BOOL	VAR_GLOBAL	MB Output Bit 03	%QX24562.3		<input checked="" type="checkbox"/>
Out_Bit_04	BOOL	VAR_GLOBAL	MB Output Bit 04	%QX24562.4		<input type="checkbox"/>
Out_Bit_05	BOOL	VAR_GLOBAL	MB Output Bit 05	%QX24562.5		<input type="checkbox"/>
Out_Bit_06	BOOL	VAR_GLOBAL	MB Output Bit 06	%QX24562.6		<input type="checkbox"/>
Out_Bit_07	BOOL	VAR_GLOBAL	MB Output Bit 07	%QX24562.7		<input type="checkbox"/>
Modbus FC#04 Qty: 1024 Input Registers, Address Range: %QB28672 - %QB30719						
ActualPosition	LREAL	VAR_GLOBAL	Crimson QW24576	%QL28672		<input type="checkbox"/>
ActualVelocity	LREAL	VAR_GLOBAL	Crimson QW24584	%QL28680		<input type="checkbox"/>
ActualTorque	LREAL	VAR_GLOBAL	Crimson QW24592	%QL28688		<input type="checkbox"/>

Figure 1 Global Variables List

## Products Used:

Component	Product and Model Number
Servopack	Sigma-5
Motor	Sigma-5
Controller	MP2300Siec
Software	MotionWorks IEC Version 2.5.0.78 Pro
Third Party Device (HMI)	RedLion Crimson 3.0 Simulator

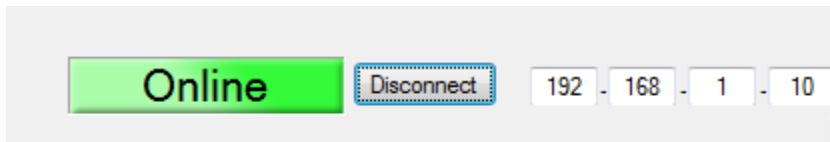
## MPiec Firmware tested

Version 2.6.0

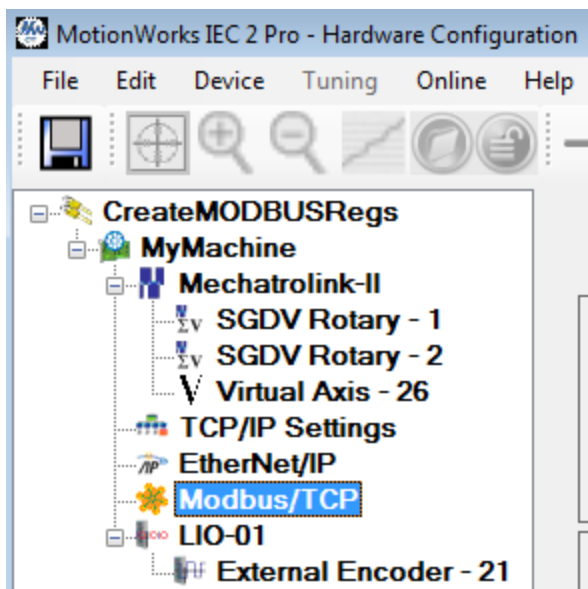
## Areas of Importance

### Hardware Configuration

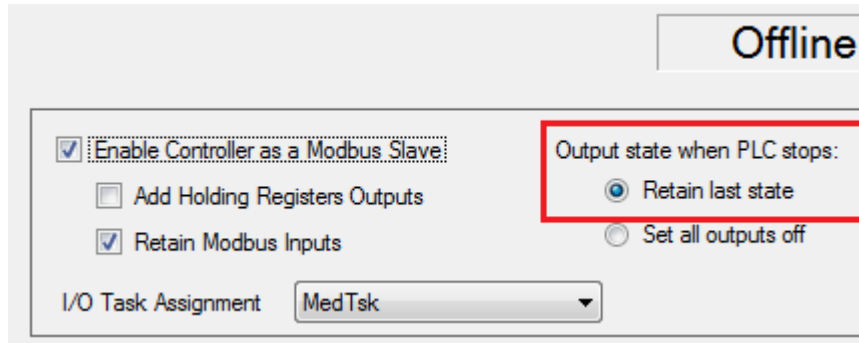
- In the Hardware Configuration, connect to the controller by clicking Online with the correct IP address



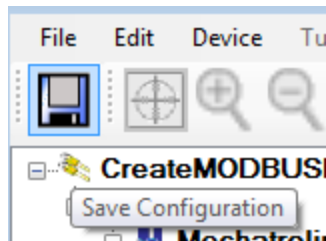
- Click on Modbus/TCP Setting from the Project Tree on the left



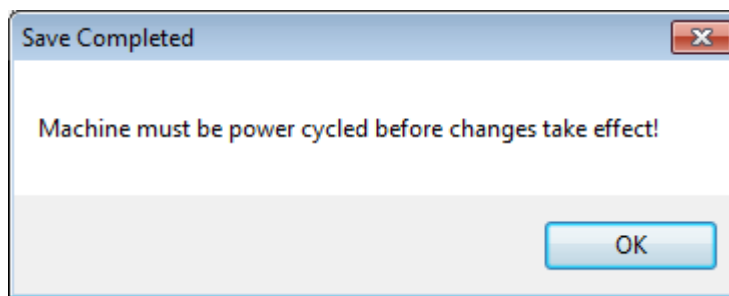
- Confirm the button "Retain last state" is selected



- Save configuration, disconnect from the controller and cycle power to the controller and servopacks

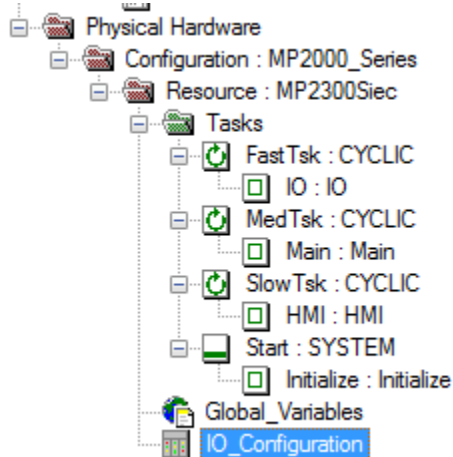
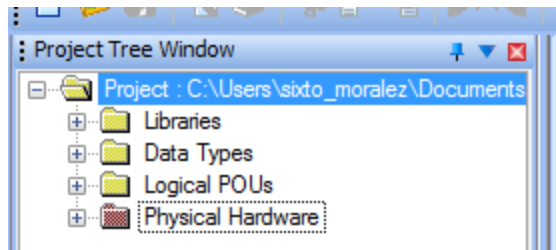


Saving the Configuration to the Controller and the Project Folder...

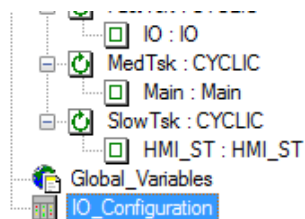


## IO\_Configuration

- Within the MotionWorks IEC environment, locate the Project Tree Window and open the Resource Folder under Physical Hardware > Configuration



- At the very bottom of the Project Tree, double click on IO\_Configuration



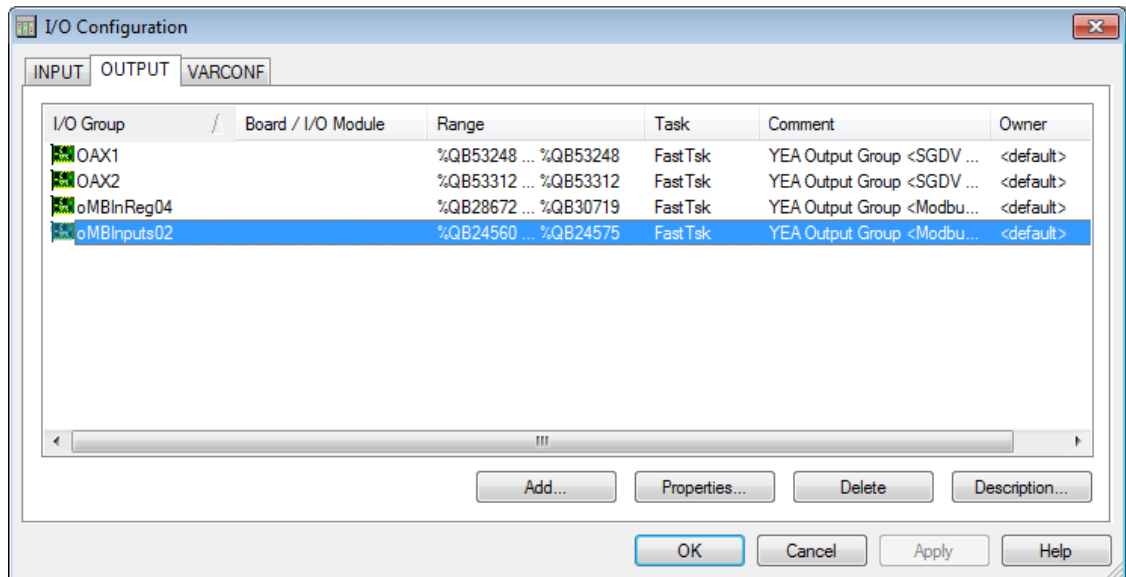
- Choose the Output Tab and the I/O Group to retain [Example shows Function Code: 02]

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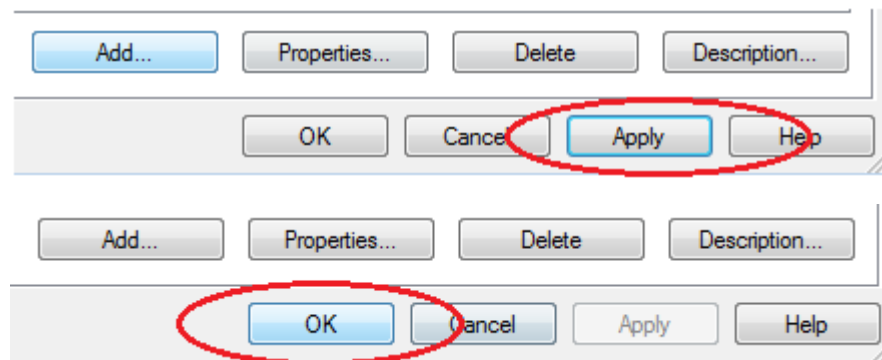
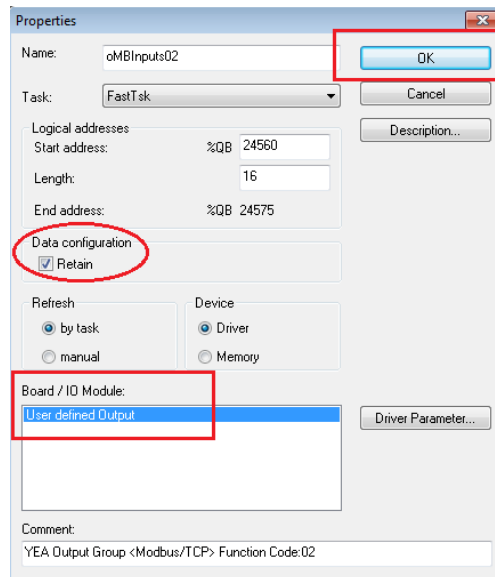
Product: MPiec Controllers

Doc#: AN.MPIEC.12

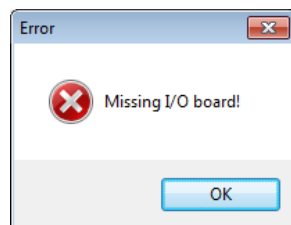
Title: How to Retain Modbus/TCP Outputs on a MPiec Controller



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- Click Properties
- Within the Properties Screen
  - Specify the starting address to retain the information and the length
    - The default number is the total length of memory for the specific group
  - Check the “Retain” check box below ‘Data Configuration’
  - Select “User defined Output” under ‘Board / IO Module’
  - Click ‘OK’, then ‘Apply’, then ‘OK’
    -

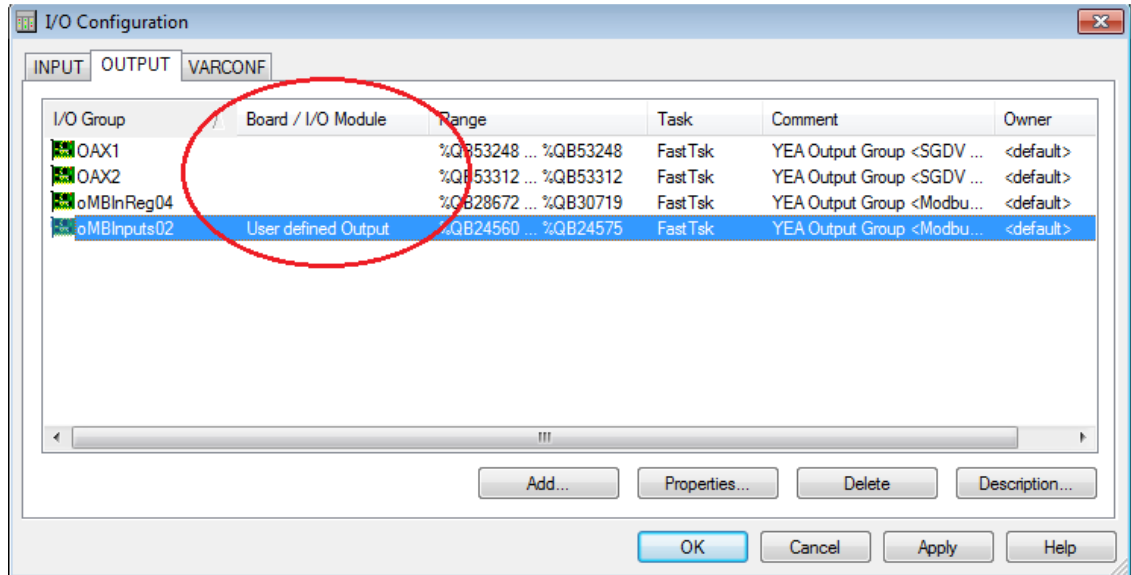


- If the error 'Missing I/O board!' appears, it is because there was no Board I/O Module selected. Please click on the "User defined Output" selection within the Board I/O Module Group



- The I/O Configuration should look like the below with the Board I/O Module Column defined



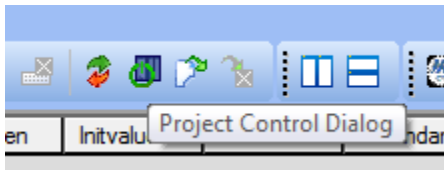


## Download

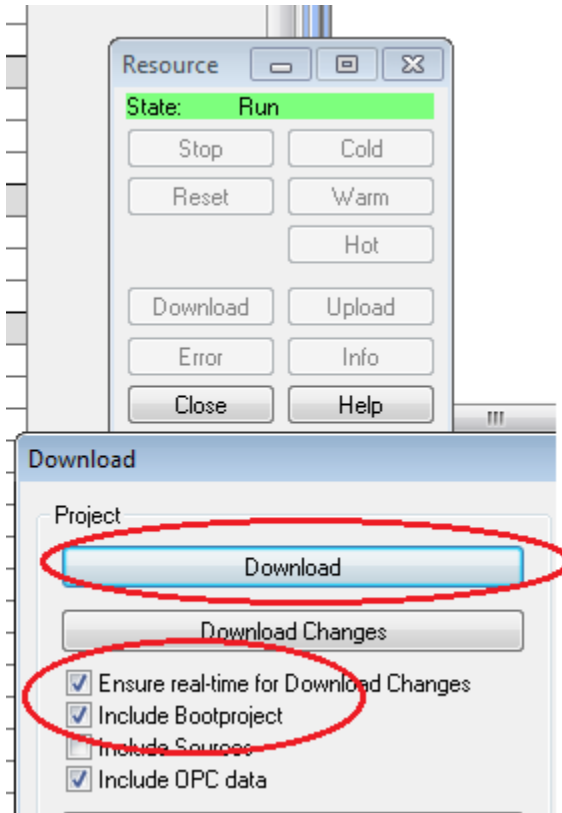
- Recompile (Make) the project



- Open the Project Control Dialog



- Download the project and boot-project

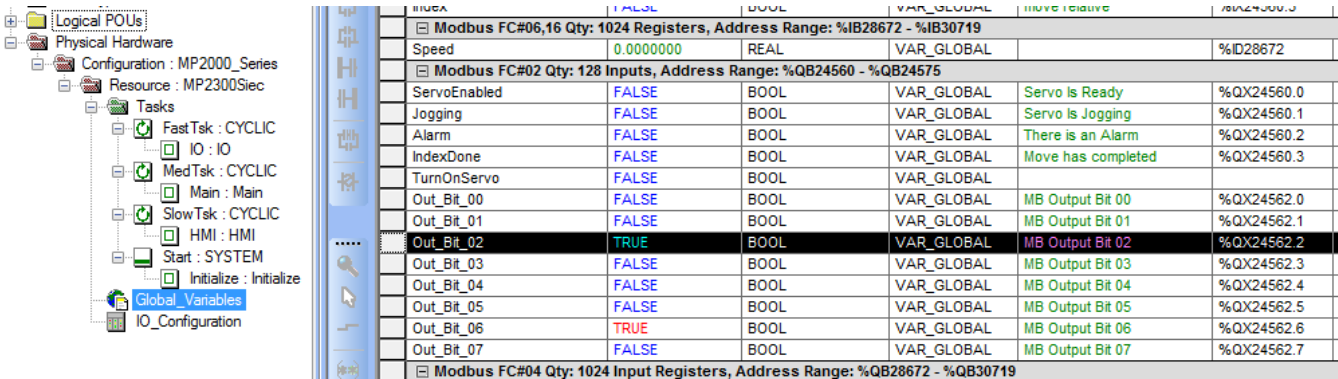


- Warm start the controller
- Modbus/TCP outputs are now ready to retain their values upon power cycle

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### Sample Program Testing

Use the MotionWorks IEC program “RetainMBOutputs.mwt” with the RedLion Crimson 3.0 “RetainMBOutputs\_HMI.cd3” program to test retaining Modbus/TCP outputs with a power cycle. Navigate to the Global Variables list and Overwrite the Out\_Bit variables, cycle power and verify the outputs are retained.



Variable Name	Value	DataType	Global Variable	Comment	Address
Speed	0.0000000	REAL	VAR_GLOBAL		%ID28672
ServoEnabled	FALSE	BOOL	VAR_GLOBAL	Servo Is Ready	%QX24560.0
Jogging	FALSE	BOOL	VAR_GLOBAL	Servo Is Jogging	%QX24560.1
Alarm	FALSE	BOOL	VAR_GLOBAL	There is an Alarm	%QX24560.2
IndexDone	FALSE	BOOL	VAR_GLOBAL	Move has completed	%QX24560.3
TurnOnServo	FALSE	BOOL	VAR_GLOBAL		
Out_Bit_00	FALSE	BOOL	VAR_GLOBAL	MB Output Bit 00	%QX24562.0
Out_Bit_01	FALSE	BOOL	VAR_GLOBAL	MB Output Bit 01	%QX24562.1
Out_Bit_02	TRUE	BOOL	VAR_GLOBAL	MB Output Bit 02	%QX24562.2
Out_Bit_03	FALSE	BOOL	VAR_GLOBAL	MB Output Bit 03	%QX24562.3
Out_Bit_04	FALSE	BOOL	VAR_GLOBAL	MB Output Bit 04	%QX24562.4
Out_Bit_05	FALSE	BOOL	VAR_GLOBAL	MB Output Bit 05	%QX24562.5
Out_Bit_06	TRUE	BOOL	VAR_GLOBAL	MB Output Bit 06	%QX24562.6
Out_Bit_07	FALSE	BOOL	VAR_GLOBAL	MB Output Bit 07	%QX24562.7

Figure 2 MWiec Global Variables Overwrite

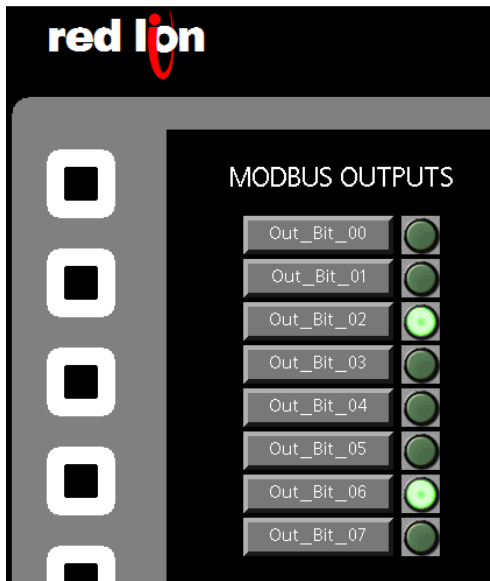


Figure 3 RedLion HMI Simulation Outputs upon power cycle