

Application Note

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 Out	outs on a MPiec Controller		

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, <u>WILL NOT</u> maintain the <u>Modbus/TCP</u> outputs upon a power cycle.

WotionWorks IEC 2 Pro - CreateMODBUSRegs - [Global_Variables:Configuration.Resource - Configuration.Resource.Global_Variables]									
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: Project Tree Window 📮 🔻 🔟	luzsi	Name	Туре	Usage	Description	Address	Init	Retain	
Project : C:\Users\sixto_moralez\Documents	hrvd -	Modbus FC#06,16 Qty: 1	024 Registers, Addr	ess Range: %IB28	572 - %IB30719	·			
		Speed	REAL	VAR_GLOBAL		%ID28672			
⊡ Data Types	ю	🖃 Modbus FC#02 Qty: 128	Inputs, Address Rar	nge: %QB24560 - %	QB24575				
E Cogical POUs		ServoEnabled	BOOL	VAR_GLOBAL	Servo Is Ready	%QX24560.0			
Physical Hardware	111	Jogging	BOOL	VAR_GLOBAL	Servo Is Jogging	%QX24560.1			
Configuration : MP2000_Senes	中	Alarm	BOOL	VAR_GLOBAL	There is an Alarm	%QX24560.2			
Resource : MP2300Siec	rth 🗖	IndexDone	BOOL	VAR_GLOBAL	Move has completed	%QX24560.3			
		TurnOnServo	BOOL	VAR_GLOBAL					
		Out_Bit_00	BOOL	VAR_GLOBAL	MB Output Bit 00	%QX24562.0		V	
		Out_Bit_01	BOOL	VAR_GLOBAL	MB Output Bit 01	%QX24562.1		V	
		Out_Bit_02	BOOL	VAR_GLOBAL	MB Output Bit 02	%QX24562.2		1	
	125	Out_Bit_03	BOOL	VAR_GLOBAL	MB Output Bit 03	%QX24562.3		V	
		Out_Bit_04	BOOL	VAR_GLOBAL	MB Output Bit 04	%QX24562.4			
	-4-	Out_Bit_05	BOOL	VAR_GLOBAL	MB Output Bit 05	%QX24562.5			
		Out_Bit_06	BOOL	VAR_GLOBAL	MB Output Bit 06	%QX24562.6			
		Out_Bit_07	BOOL	VAR_GLOBAL	MB Output Bit 07	%QX24562.7			
		Modbus FC#04 Qty: 102	4 Input Registers, Ad	ddress Range: %Q	B28672 - %QB30719				
IN TO Configuration		ActualPosition	LREAL	VAR_GLOBAL	Crimson QW24576	%QL28672			
		ActualVelocity	LREAL	VAR_GLOBAL	Crimson QW24584	%QL28680			
	4	ActualTorque	LREAL	VAR_GLOBAL	Crimson QW24592	%QL28688			

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



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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

File	Edit	Device	Tu		
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	Creat	eMODB	US		
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_	<u>с</u>	Machat	rolii		
Saving t	he Conf	iguration to	the Cont	roller and	the

Project Folder...

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IO_Configuration

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

	🗄 Project Tree Window 🛛 📮 💌 🔣 📗
	Project : C:\Users\sixto moralez\Documents
	E- Logical POUs
	Physical Hardware
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	🖃 🎰 Physical Hardware
	Configuration : MP2000_Series
	Resource : MP2300Siec
	🚊 🖓 🎆 Tasks
	🖨 🕐 FastTsk : CYCLIC
	IO : IO
	🗎 🕐 MedTsk : CYCLIC
	Main : Main
	SlowTsk : CYCLIC
	HMI : HMI
	🖻 🖳 Start : SYSTEM
	Initialize : Initialize
	Global_Variables
	IO_Configuration
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• At the very bottom of the Project Tree, double click on IO_Configuration



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



I/O Group	1	Board / I/O Module	Range	Task	Comment	Owner
	- A		*OP52240 *OP52240	EastTak	VEA Output Group (SGDV)	<defaults.< td=""></defaults.<>
			%QD55240 %QD55240 %OD52212 %OD52212	FastTek	YEA Output Group <sgdv< td=""><td><default></default></td></sgdv<>	<default></default>
oMBInBeg04			%QB28672 %QB30719	FastTsk	YEA Output Group <modbu< td=""><td><default></default></td></modbu<>	<default></default>
oMBloouts02			XOB24560 XOB24575	FaetTek	YEA Output Group <modbu< td=""><td><default></default></td></modbu<>	<default></default>
4						

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



Name: MBInputS02 DK Task: EastTask Cancel Logical addresses 20B 24560 Length: 16 Description End address: 20B 24575 Data configuration Refain Device Partial Device Device Nameal Memory Board /10 Module: Device Driver Driver Parameter Saard /10 Module: Driver Parameter Comment: YEA Output Group Memory Saard /10 Module: Driver Parameter Delete Description Comment: YEA Output Group Module: Delete Description Add Properties Delete Description OK Cance Apply Hep	Name: oMBInpu		×		
rask: FastTak Cancel Logical addresses Start a		ts02	ОК		
Logical addresses Start addresses 2008 24575 Data configuration P Retain Refresh @ by tack @	Task: FastTsk		· Cancel		
Start address: xQB 24560 Length: 16 End address: xQB 24575 Data configuration P Retain Refersh Device	Logical addresses		Description		
Length: 16 End address: 20B 24575 Data configuration Refresh Device by task Driver manual Memory 30aid /10 Module: User delined Dufput Driver Parameter Comment: YEA Dutput Group (Modbus/TCP): Function Code 02 Comment: YEA Dutput Group (Modbus/TCP): Function Code 02 Add Properties Delete Description OK Cance Apply Hep Add Properties Delete Description	Start address:	%QB 24560			
End address: 20B 24575 Data configuration Pretesh Device © by task © Driver manual Memory Joard /10 Module: Uter defined Dutput Driver Parameter Comment: YEA Dutput Group (Modbus/TCP) Function Code:02 Add Properties Delete Description Add Properties Delete Description OK Cancel Apply Help	Length:	16			
Data configuration Retrain Refresh Device Diver Imanual Memory Board / ID Module: User defined Output Driver Parameter Comment: YEA Dutput Group YEA Dutput Group Module: OK Cance Add Properties Delete Description Add Properties Delete Description	End address:	%QB 24575			
Retrain Retrain Betrain Device Diver Imanual Memory Diver Parameter Device defined Output Diver Parameter Device Description OK Cance Apply Hep Add Properties Delete Description OK Add Properties Delete Description Keinet Add Properties Delete Description	Data configuration		1		
Befresh Device by task Driver Board / ID Module: User defined Output Driver Parameter: Comment: YEA Duput Group YEA Duput Group Medd Properties Delete Description Add Properties Delete Description Add Properties Delete Description OK OK Apply Help	🔽 Retain				
by task Oriver manual Memory Baard / 10 Module: User defined Output Driver Parameter Comment: YEA Output Group <modbus tcp=""> Function Code:02 Add Properties Delete Description OK Cance Apply Hep</modbus>	Refresh	Device			
Image: manual Memory Board / 10 Module: User defined Output Driver Parameter Comment: YEA Output Group YEA Output Group Medd Properties Delete OK Cance Add Properties Delete Description	by task	 Driver 			
Board / ID Module: Driver Parameter Description Driver Parameter Comment: YEA Output Group <modbus tcp=""> Function Code:02 Add Properties Delete Description OK Cance Add Properties Delete Description</modbus>	🔘 manual	Memory			
User defined Output Driver Parameter Comment: YEA Output Group <modbus tcp=""> Function Code:02 Add Properties Delete Description OK Cance Apply Hep Add Properties Delete Description</modbus>	Board / IO Module:				
Comment: YEA Dutput Group (Modbus/TCP) Function Code:02 Add Properties Delete Description OK Cance Apply Hep Add Properties Delete Description	User defined Output		Driver Parameter		
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YEA Output Group <modbus tcp=""> Function Code:02 Add Properties Delete Description OK Cance Apply Hep Add Properties Delete Description OK Oance Apply Hep</modbus>	Comment:				
Add Properties Delete Description OK Cance Apply Hep Add Properties Delete Description OK Qancel Apply Help	YEA Output Group <mo< td=""><td>dbus/TCP> Function Code:02</td><td></td><td></td><td></td></mo<>	dbus/TCP> Function Code:02			
Add Properties Delete Description OK Cance Apply Hep Add Properties Delete Description OK Qancel Apply Help					
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• 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

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Download the project and boot-project





• Warm start the controller

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• Modbus/TCP outputs are now ready to retain their values upon power cycle



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.

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	10		Modbus FC#06,16 Qt	y: 1024 Registers, Ac	Idress Range: %IB286	72 - %IB30719		
Physical Hardware	41	" Г	Speed	0.0000000	REAL	VAR_GLOBAL		%ID28672
Configuration : MP2000_Series	ΗН		E Modbus FC#02 Qty: 1	28 Inputs, Address	Range: %QB24560 - %(B24575		
Resource : MP2300Siec		10	ServoEnabled	FALSE	BOOL	VAR_GLOBAL	Servo Is Ready	%QX24560.0
🖃 🖓 📷 Tasks	1		Jogging	FALSE	BOOL	VAR GLOBAL	Servo Is Jogging	%QX24560.1
FastTsk : CYCLIC	TH		Alarm	FALSE	BOOL	VAR GLOBAL	There is an Alarm	%QX24560.2
IO : IO	41		IndexDone	FALSE	BOOL	VAR GLOBAL	Move has completed	%QX24560.3
MedTsk : CYCLIC	-k	L E	TurnOnServo	FALSE	BOOL	VAR_GLOBAL		
Main : Main	17		Out_Bit_00	FALSE	BOOL	VAR_GLOBAL	MB Output Bit 00	%QX24562.0
SlowTsk : CYCLIC			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
Start : SYSTEM			Out_Bit_03	FALSE	BOOL	VAR_GLOBAL	MB Output Bit 03	%QX24562.3
Initialize : Initialize			Out_Bit_04	FALSE	BOOL	VAR_GLOBAL	MB Output Bit 04	%QX24562.4
Global_Variables			Out_Bit_05	FALSE	BOOL	VAR_GLOBAL	MB Output Bit 05	%QX24562.5
IO_Configuration		10	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
		9	E Modbus FC#04 Qty: 1	024 Input Registers,	Address Range: %QE	328672 - %QB30719	l	

Figure 2 MWiec Global Variables Overwrite



Figure 3 RedLion HMI Simulation Outputs upon power cycle