

M-7679 R-PAC QUICK REFERENCE GUIDE

PROTECTION, AUTOMATION AND CONTROL SYSTEM FOR RECLOSER, SWITCH, SECTIONALIZER AND ADVANCED DISTRIBUTION AUTOMATION APPLICATIONS.

DNP Communication Setup



Required Tools:

- PC running Windows 7® or higher
- S-7600 IPScom Communications Software

Download the latest **IPScom software** at:

<https://beckwithelectric.com/products/s-7600/>

Required Documentation:

- M-7679 Instruction Book
- M-7679 Application Guide
- Communications and Cybersecurity A.G.

Download the latest **M-7679 Instruction Book** at:

<https://beckwithelectric.com/products/m-7679/>

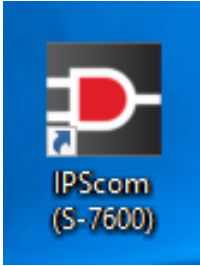
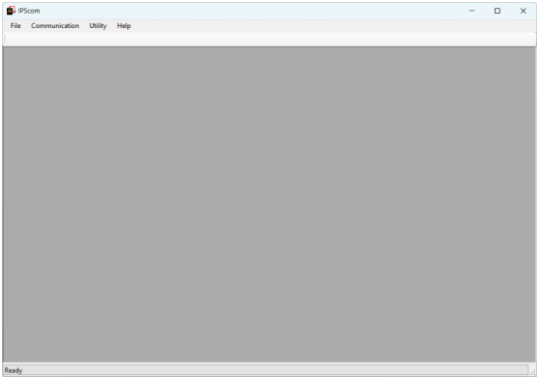
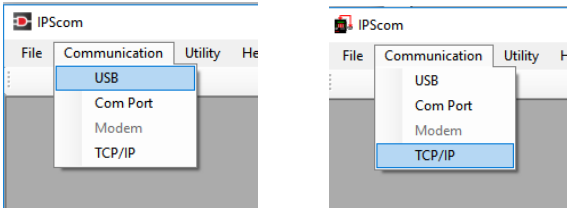
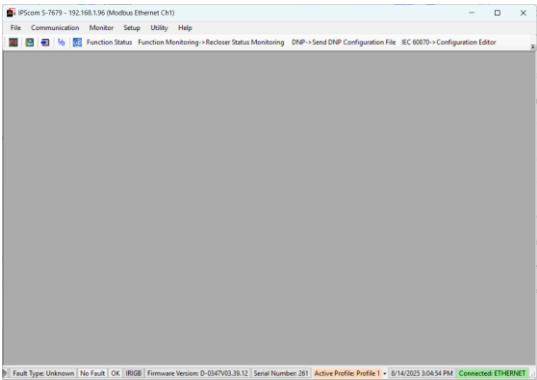


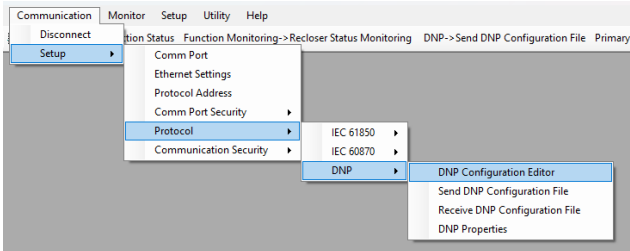
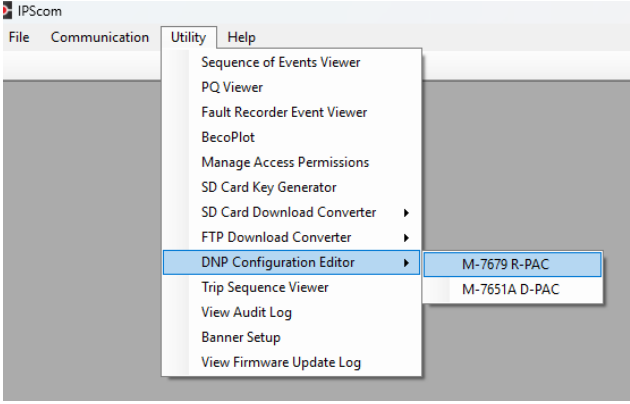
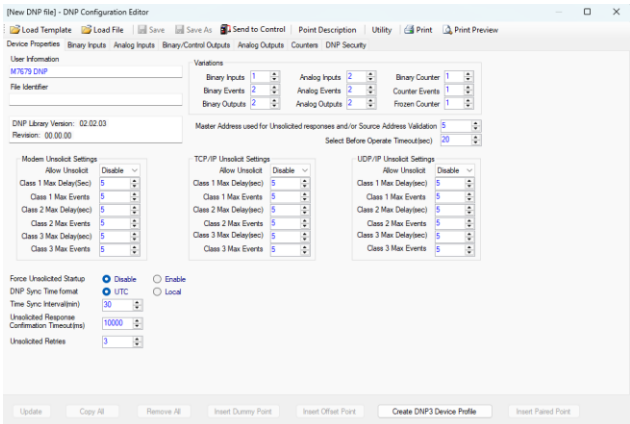
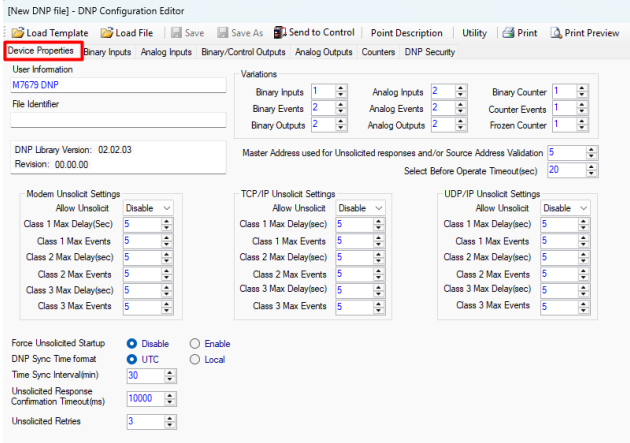
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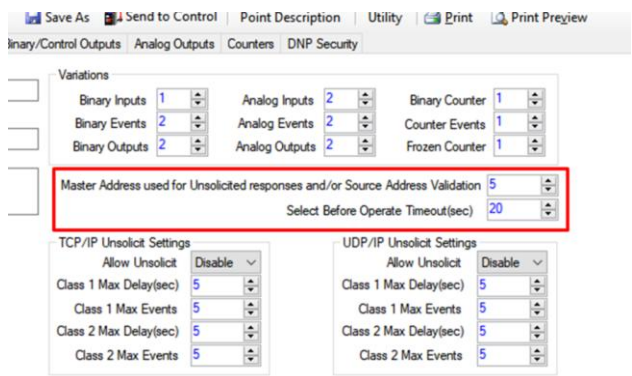
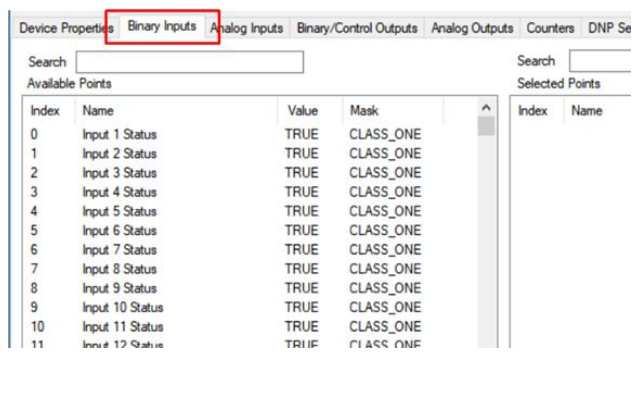
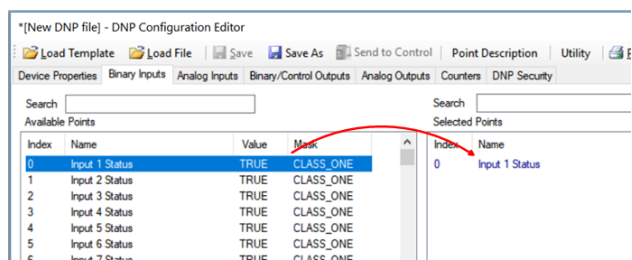
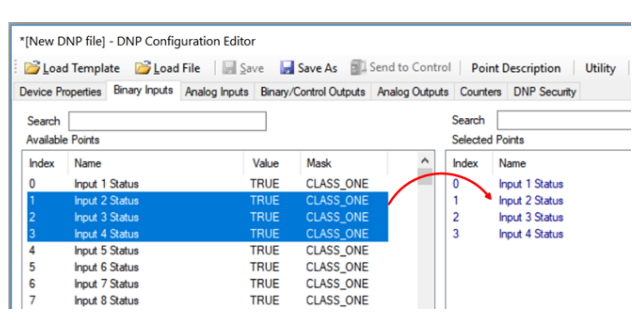
DNP Communication Setup

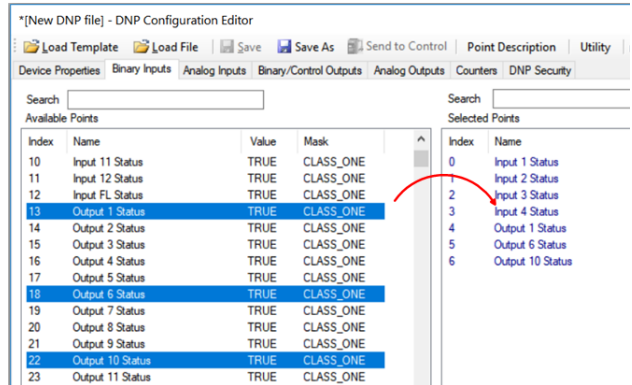
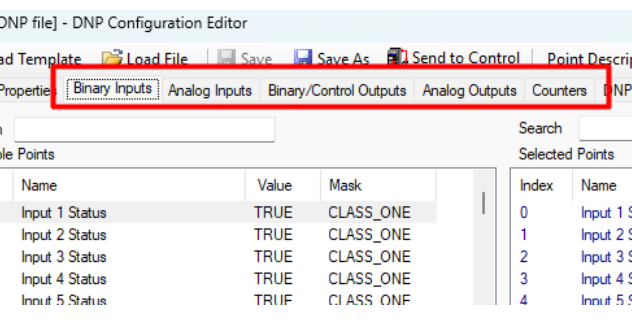
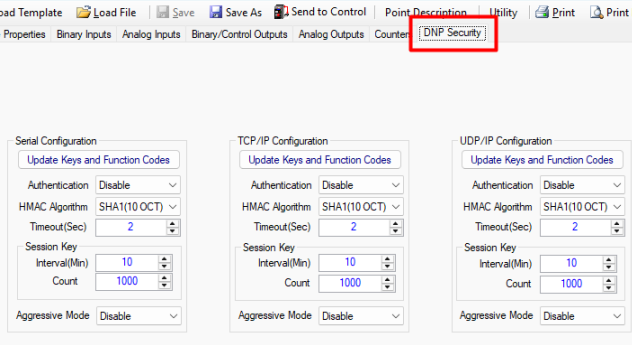
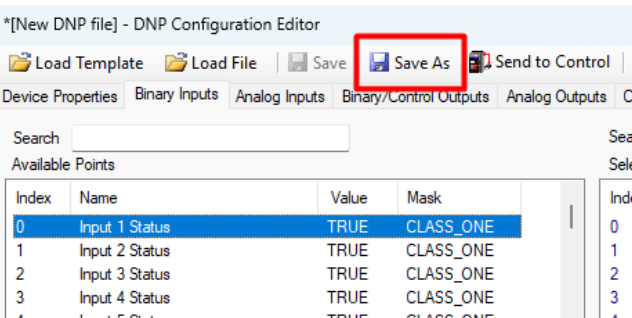
This Quick Reference Guide provides the procedures and requirements necessary to integrate the **M-7679 R-PAC** with any **SCADA Master Station** using the DNP3 communication protocol. It includes detailed configuration instructions, implementation steps, and communication setup requirements to ensure proper system integration. In addition, the document outlines the verification and validation procedures required to confirm successful establishment of communications and reliable data exchange between the M-7679 R-PAC and the SCADA system.

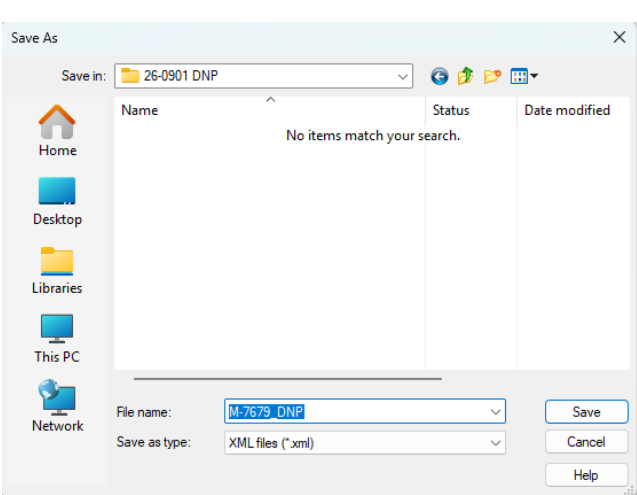
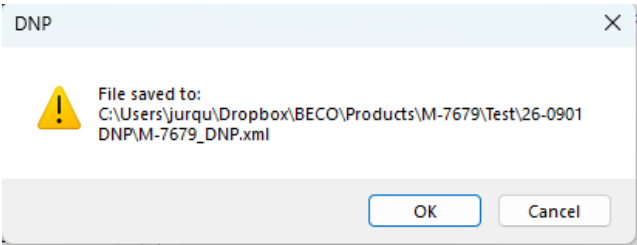
Create and Save the DNP file

1	Start IPScm Software by double-clicking the corresponding shortcut.	
2	IPScm will display the IPScm Main dialog screen.	
3	If the process is going to be performed while connected to a M-7679 R-PAC unit, connect to the unit using USB or TCP/IP modes.	
4	Once the connection has been established, IPScm will display the Connected version of the IPScm Main Screen.	

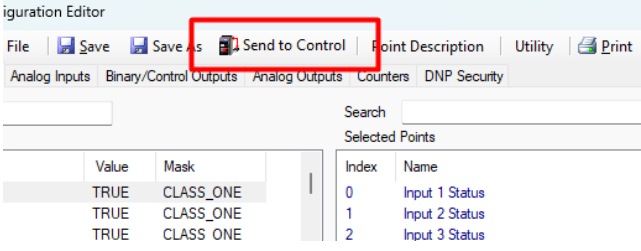
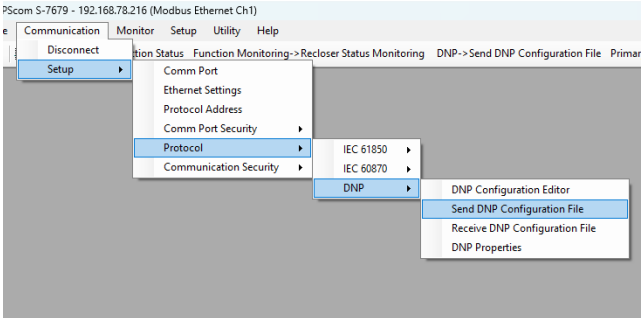
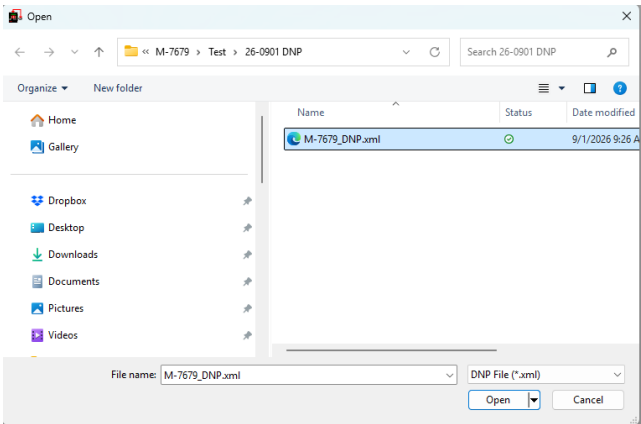
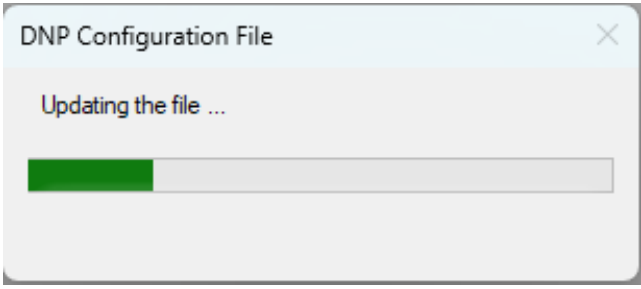
5	Go to Communications / Setup / Protocol / DNP / DNP Configuration Editor . Go to step 7.	
6	If the process will be performed without a connection to a M-7679 R-PAC unit, in the main screen (not connected version) navigate to Utility / DNP Configuration Editor / M-7679 R-PAC .	
7	IPScom will display the DNP Configuration Editor with a new blank file created.	
8	The Device Properties tab includes all the DNP device connection settings. In order to stablish the DNP connection, these settings must be adjusted by the user before connecting to a DNP master.	

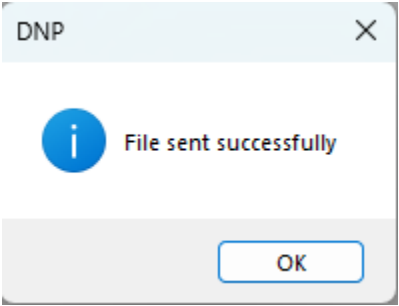
9	The Master address for unsolicited response is the DNP address that the M-7679 R-PAC will use to report unsolicited events. The Select Before Operate timeout is the confirmation time between a Select message and the corresponding command under SBO mode.																																																					
10	The Binary Inputs tab allows the user to choose the required binary signals to build the digital DNP map.	 <table><thead><tr><th>Index</th><th>Name</th><th>Value</th><th>Mask</th></tr></thead><tbody><tr><td>0</td><td>Input 1 Status</td><td>TRUE</td><td>CLASS_ONE</td></tr><tr><td>1</td><td>Input 2 Status</td><td>TRUE</td><td>CLASS_ONE</td></tr><tr><td>2</td><td>Input 3 Status</td><td>TRUE</td><td>CLASS_ONE</td></tr><tr><td>3</td><td>Input 4 Status</td><td>TRUE</td><td>CLASS_ONE</td></tr><tr><td>4</td><td>Input 5 Status</td><td>TRUE</td><td>CLASS_ONE</td></tr><tr><td>5</td><td>Input 6 Status</td><td>TRUE</td><td>CLASS_ONE</td></tr><tr><td>6</td><td>Input 7 Status</td><td>TRUE</td><td>CLASS_ONE</td></tr><tr><td>7</td><td>Input 8 Status</td><td>TRUE</td><td>CLASS_ONE</td></tr><tr><td>8</td><td>Input 9 Status</td><td>TRUE</td><td>CLASS_ONE</td></tr><tr><td>9</td><td>Input 10 Status</td><td>TRUE</td><td>CLASS_ONE</td></tr><tr><td>10</td><td>Input 11 Status</td><td>TRUE</td><td>CLASS_ONE</td></tr><tr><td>11</td><td>Input 12 Status</td><td>TRUE</td><td>CLASS_ONE</td></tr></tbody></table>	Index	Name	Value	Mask	0	Input 1 Status	TRUE	CLASS_ONE	1	Input 2 Status	TRUE	CLASS_ONE	2	Input 3 Status	TRUE	CLASS_ONE	3	Input 4 Status	TRUE	CLASS_ONE	4	Input 5 Status	TRUE	CLASS_ONE	5	Input 6 Status	TRUE	CLASS_ONE	6	Input 7 Status	TRUE	CLASS_ONE	7	Input 8 Status	TRUE	CLASS_ONE	8	Input 9 Status	TRUE	CLASS_ONE	9	Input 10 Status	TRUE	CLASS_ONE	10	Input 11 Status	TRUE	CLASS_ONE	11	Input 12 Status	TRUE	CLASS_ONE
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11	The column at the left includes all available binary points that the user can use to build the DNP map. To include a signal, just drag the desired signal from the left to the right.																																																					
12	To include more than one consecutive binary points at the time select the desired points using the Shift key and drag them to the right column.																																																					

13	To include more than one non-consecutive binary points at the time select the desired points using the Control key and drag them to the right column.	
14	Use the same drag-and-drop procedure to build the remaining sections of the DNP map: • Analog Inputs • Binary/Control Outputs • Analog Outputs • Counters	
15	The DNP Security tab includes all the DNP protocol security settings. Those settings can be enabled independently for serial or Ethernet (both TCP or UDP). The concepts of the Hashed Message Authentication Code (HMAC) and challenge-response as defined in the DNP specification for Secure Authenticate Version 2.0 document is employed.	
16	Once all the DNP settings have been done click on the Save As button.	

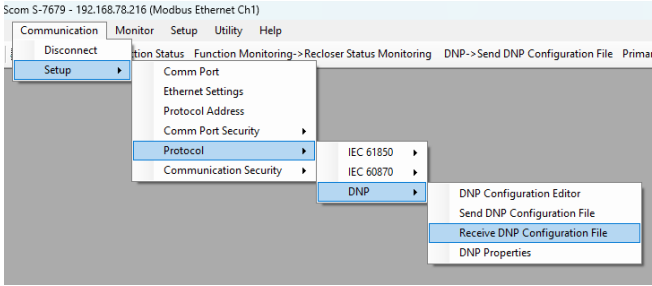
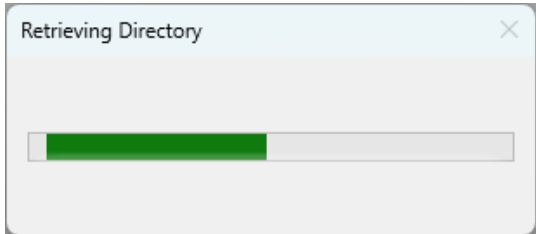
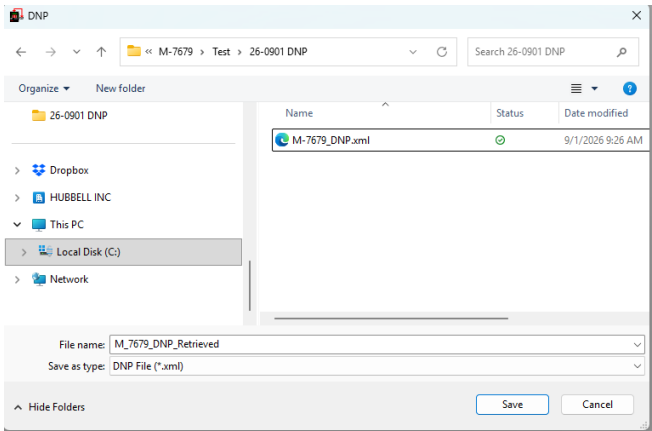
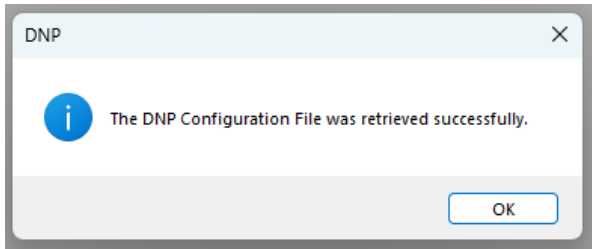
17	IPScorm will display a Save As dialog box. Find a location, assign a name to the XML document and then press Save .	
18	IPScorm will display a confirmation message indicating that the XML file was successfully saved.	
End of Procedure.		

Send the DNP file to the M-7679 R-PAC

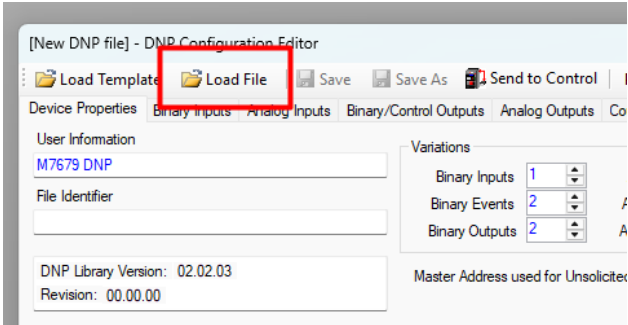
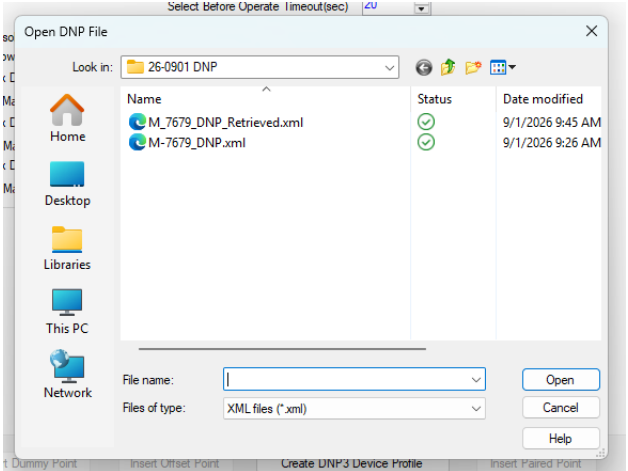
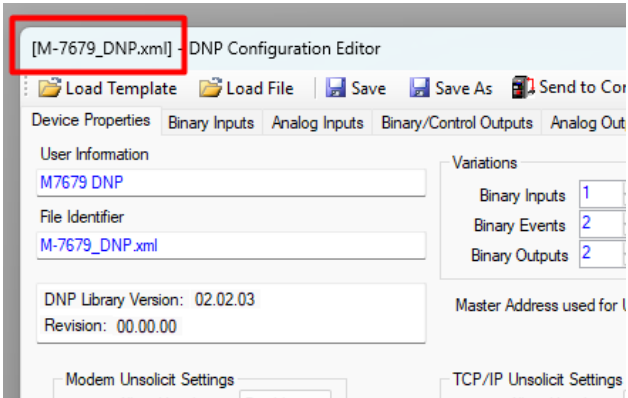
1	When connected to a unit the Send to Control button in the DNP Configuration Editor will be active. To send the XML file to the M-7679 R-PAC press the Send to Control button.	
2	The user can also find the Send to Control option by going to Communication / Setup / Protocol / DNP / Send DNP Configuration File.	
3	IPSCOM will display an Open dialog box. Find and select the DNP XML document to be sent and then press Open.	
4	IPSCOM will start the sending process indicating the corresponding progress.	

5	Once the file has been sent IPScom will display a confirmation message.	
End of Procedure.		

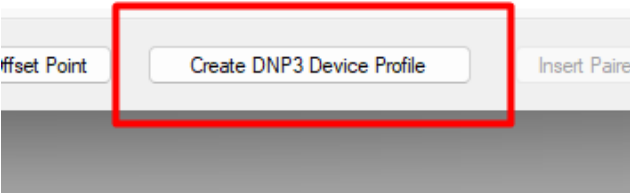
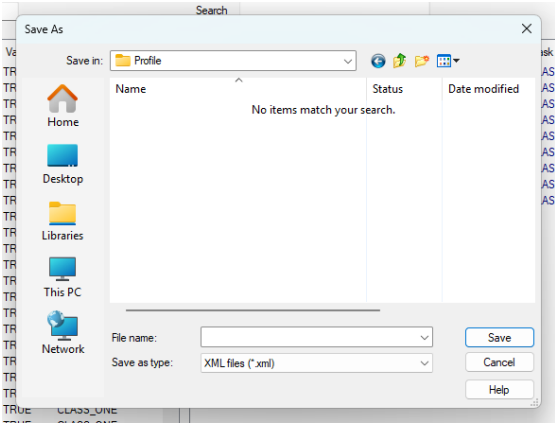
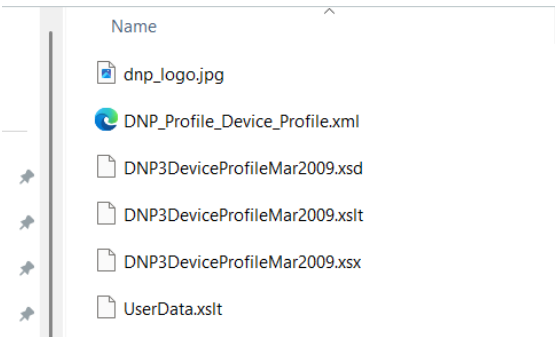
Retrieve the DNP file from the M-7679 R-PAC

1	When connected to a unit the user can retrieve the DNP file from the unit by going to Communication / Setup / Protocol / DNP / Receive DNP Configuration File.	
2	IPSCOM will start the retrieving process indicating the corresponding progress.	
3	IPSCOM will display a Save As dialog box. Find a location, assign a name to the XML document and then press Save.	
4	Once the file has been retrieved IPSCOM will display a confirmation message.	
End of Procedure.		

Load a DNP file in the Configuration Editor

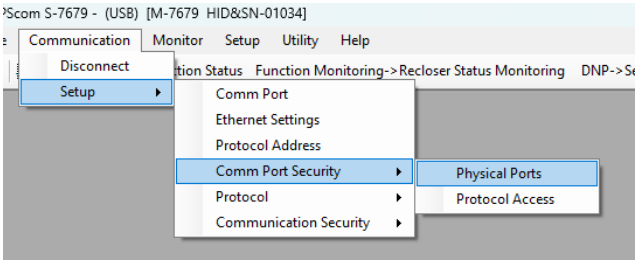
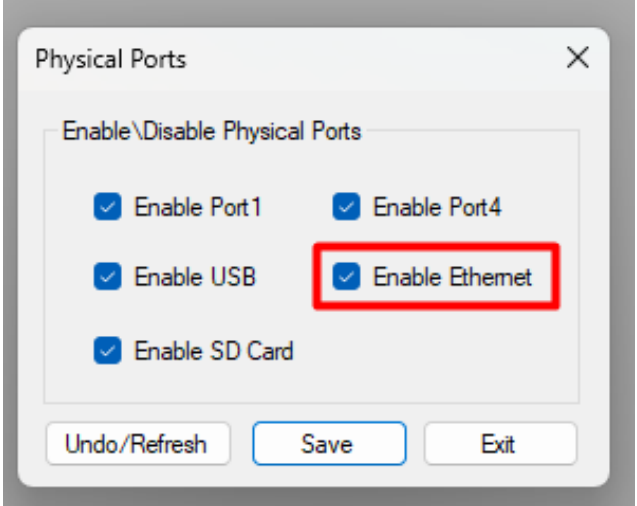
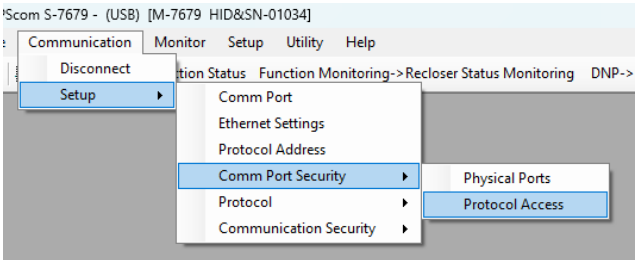
1	To visualize the information contained in a previously created or retrieved DNP file select the Load File button in the Configuration Editor.	
2	IPSCOM will display an Open dialog box. Find and select the DNP XML document and then press Open .	
3	The DNP Configuration Editor will load the information contained in the opened DNP file, indicating the name of the file at the top left corner of the screen. The user can now view and edit the file as required.	

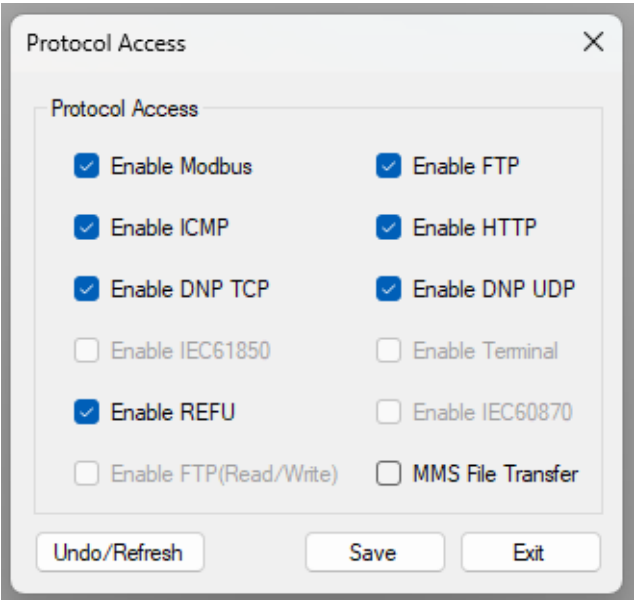
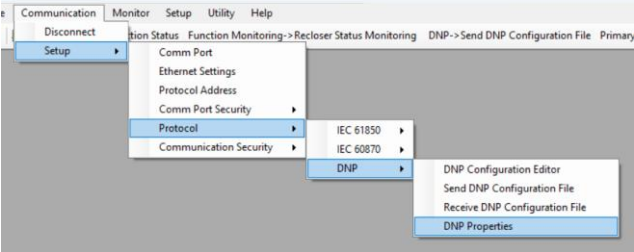
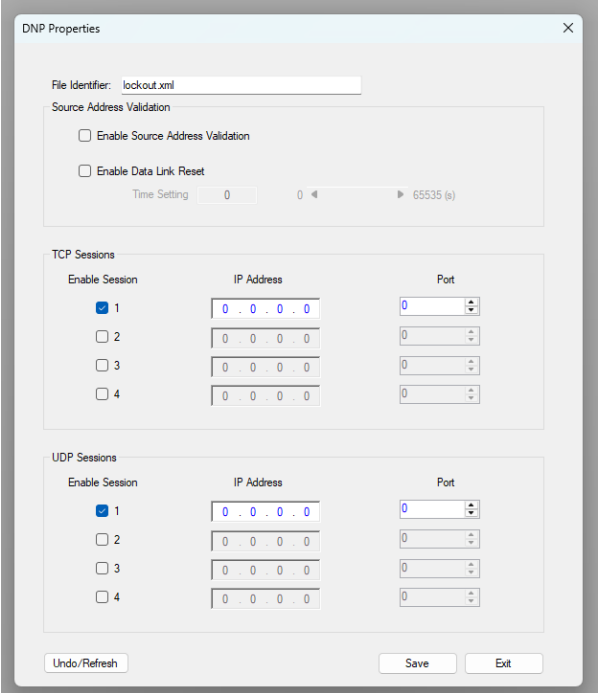
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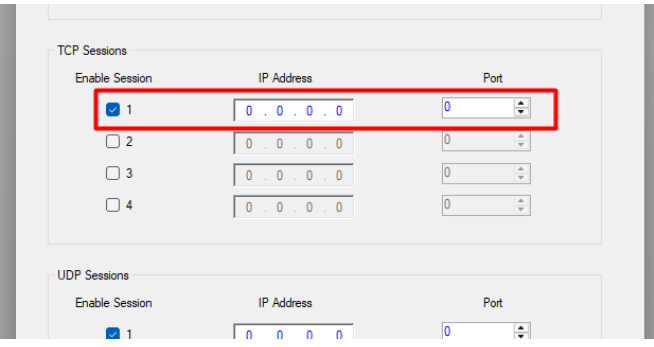
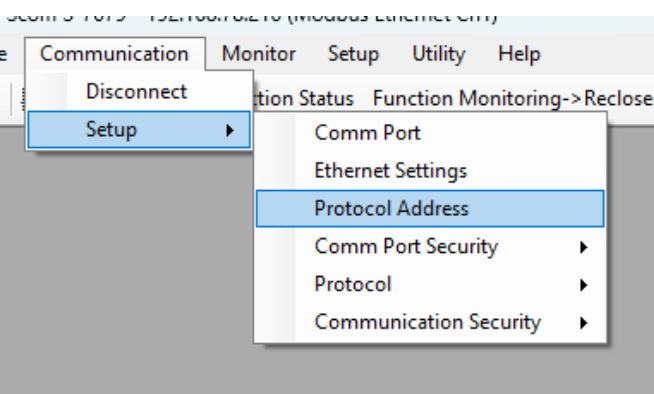
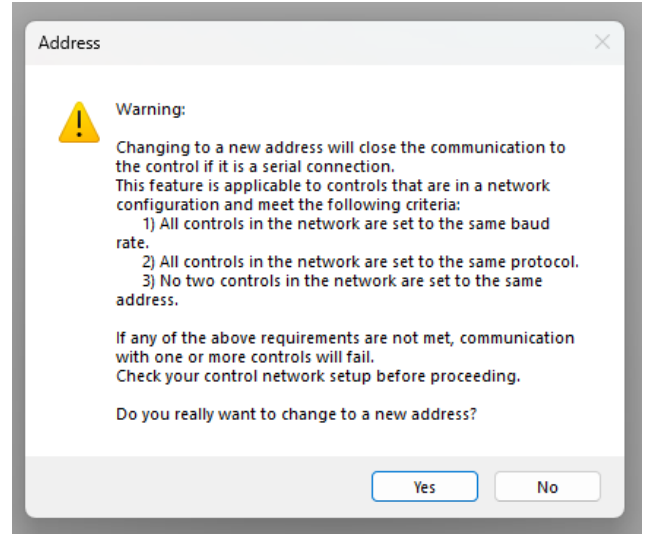
Create and Save the DNP Device Profile Document		
1	Once all the DNP map configuration has been done, press the Create DNP3 Device Profile button located at the bottom right section of the screen.	
2	IPScorm will display a Save As dialog box. Find a location, assign a name to the xml document and then press Save .	
3	IPScorm will create the DNP Device Profile document based on the currently loaded file. Open the folder location where the file was created. It must contain the following files.	
End of Procedure.		

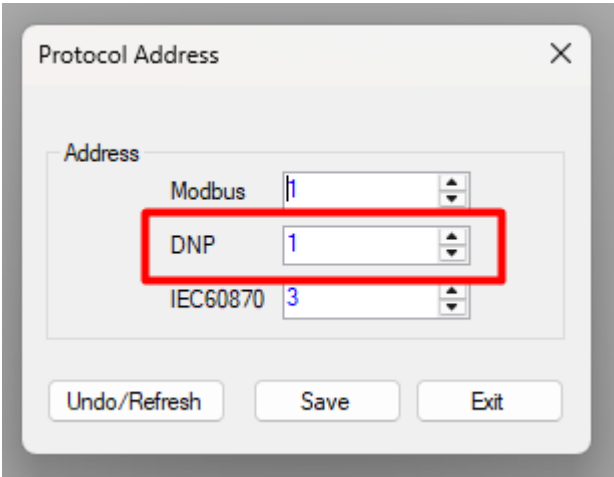
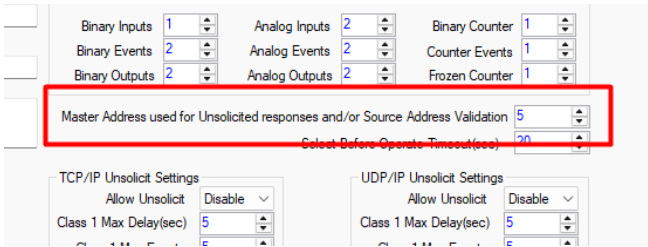
DNP Communication Configuration and Verification

This section provides the configuration requirements and verification procedures necessary to ensure reliable DNP communication between the **M-7679 R-PAC** and a **SCADA** master station. By following the steps outlined in this section, personnel responsible for SCADA integration can successfully configure, validate, and commission the communication interface, ensuring a smooth and efficient integration process.

1	Navigate to Communication / Setup / Comm Port Security / Physical Ports .	
2	Make sure Ethernet port is enabled.	
3	Navigate to Communication / Setup / Comm Port Security / Protocol Access .	

4	Ensure that the required communication protocols are enabled and disable any unused protocols to enhance cybersecurity and minimize unnecessary network traffic. In most applications, Ethernet-based DNP communications are configured to use TCP .	 The 'Protocol Access' dialog box is shown with a close button (X) in the top right corner. It contains a list of protocols with checkboxes: 'Enable Modbus' (checked), 'Enable ICMP' (checked), 'Enable DNP TCP' (checked), 'Enable IEC61850' (unchecked), 'Enable REFU' (checked), 'Enable FTP(Read/Write)' (unchecked), 'Enable FTP' (checked), 'Enable HTTP' (checked), 'Enable DNP UDP' (checked), 'Enable Terminal' (unchecked), 'Enable IEC60870' (unchecked), and 'MMS File Transfer' (unchecked). At the bottom are buttons for 'Undo/Refresh', 'Save', and 'Exit'.
5	Navigate to Communication > Setup > Protocol > DNP > DNP Properties .	 A screenshot of the software's menu system. The 'Communication' menu is open, showing 'Setup', 'Monitor', 'Setup', 'Utility', and 'Help'. The 'Setup' menu is further open, showing 'Comm Port', 'Ethernet Settings', 'Protocol Address', 'Comm Port Security', 'Protocol', and 'Communication Security'. The 'Protocol' menu is open, showing 'IEC 61850', 'IEC 60870', and 'DNP'. The 'DNP' menu is open, showing 'DNP Configuration Editor', 'Send DNP Configuration File', 'Receive DNP Configuration File', and 'DNP Properties'.
6	IPSCom will display the DNP Properties screen.	 The 'DNP Properties' dialog box is shown with a close button (X) in the top right corner. It contains a 'File Identifier' field with 'lockout.xml'. Below it is a 'Source Address Validation' section with 'Enable Source Address Validation' (unchecked) and 'Enable Data Link Reset' (unchecked). A 'Time Setting' field shows '0' and '65535 (s)'. Below that is a 'TCP Sessions' section with a table of sessions. The first session is enabled (checked) and has IP Address '0.0.0.0' and Port '0'. Below that is a 'UDP Sessions' section with a similar table. The first session is enabled (checked) and has IP Address '0.0.0.0' and Port '0'. At the bottom are buttons for 'Undo/Refresh', 'Save', and 'Exit'.

7	In the DNP Properties screen, under the TCP Sessions section, verify that Session #1 is enabled. Ensure that both the IP Address and Port Number fields are configured to 0.	
8	Confirm that the DNP addresses assigned to the SCADA (master) and the M-7679 R-PAC (slave) match the intended system configuration. To view or modify the M-7679 R-PAC DNP address, navigate to Communication > Setup > Protocol Address.	
9	A warning message will be displayed informing to the user the consequences of changing the DNP protocol addresses after communication has been established. Verify that the changes are intended before continuing.	

10	In the Protocol Address screen, verify that the configured DNP address matches the intended address for the M-7679 R-PAC . Ensure that this value corresponds to the address configured in the SCADA Master and is consistent with the system communication design.	
11	Use the DNP Configuration Editor to verify that the Master Address configured for Unsolicited Responses matches the DNP address of the SCADA Master. This setting is used for unsolicited response communications and must correspond to the intended master address in the SCADA system.	
End of Procedure.		



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