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1. CONNECTING THE EDGE DEVICE TO YOUR COMPUTER

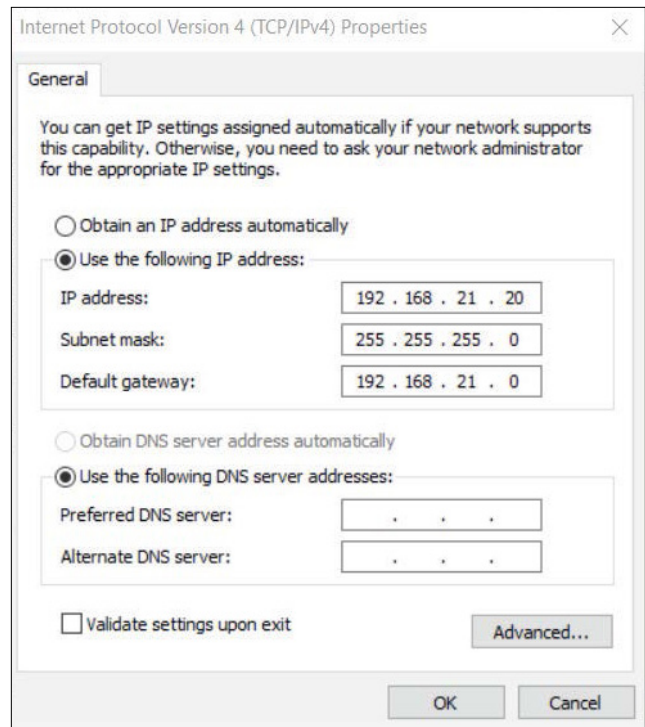
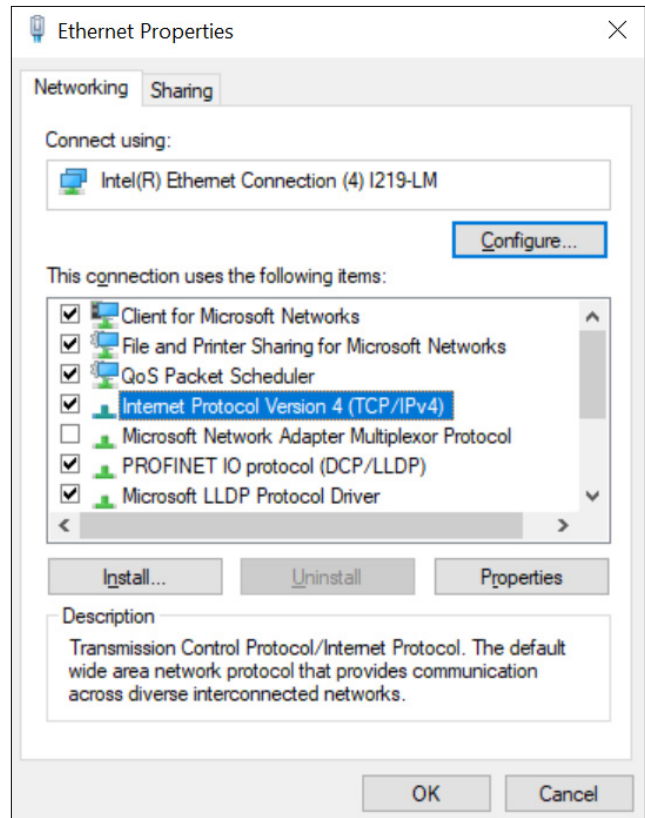
Prior to beginning this process, please connect an Ethernet cable from the Ethernet port of your PC to the WAN port (pictured below) on the Edge Device.



2. SET COMMUNICATION SETTINGS OF YOUR PC AND EDGE DEVICE

A. SET THE IP ADDRESS IN YOUR PC IN ORDER TO ASSIGN A NEW IP ADDRESS TO THE EDGE DEVICE. EXAMPLE BELOW IS WINDOWS.

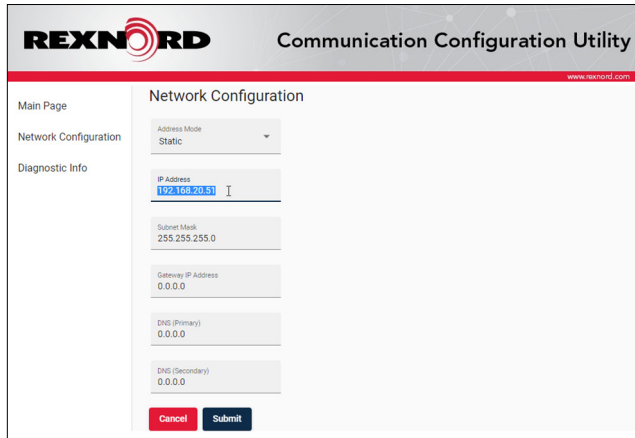
1. Open the Control Panel from your desktop.)
2. Select "Network and Internet"
3. Select "Network and Sharing Center"
4. Select "Change Adapter Settings"
5. Select Ethernet Adaptor.
6. Select "Internet Protocol Version 4"
7. Select "Use the Following IP Address"
8. Use any address in the 192.168.21.xxx subnet that is not 192.168.21.2, 192.168.21.0, or your PLC's configured IP address (default is 192.168.20.51)
9. Use this Subnet Mask: 255.255.255.0
10. Select "Ok"



B. SET THE IP ADDRESS OF YOUR EDGE DEVICE SO THAT IT WILL BE VISIBLE TO THE PLC

This step only needs to be done for non-PROFINET protocols.

1. Enter 192.168.21.2:8000/network into the browser URL.
2. Click on "Network Configuration."



Note: DNS fields and the [Cancel] button are not used.

3. Change the Address Mode, IP Address, Subnet Mask and Gateway IP Address as needed, by selecting those fields and selecting/typing in new value(s).
4. Press the [Submit] button to set the values to the Edge's LAN port.

Note: There is no feedback that this operation has been executed.

5. Wait 2 minutes and cycle power to the Edge computer. 5 minutes after it starts back up it will be completely configured to communicate the new PLC protocol on the LAN port.
6. Disconnect computer from WAN port and reconnect any previous connection to it.
7. Connect PC to LAN port and makes sure the IP address is set to same network as assigned. Ping Edge Devices IP address to see if changes are complete.

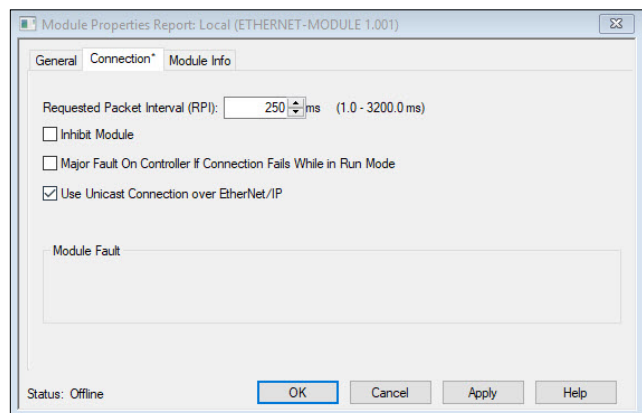
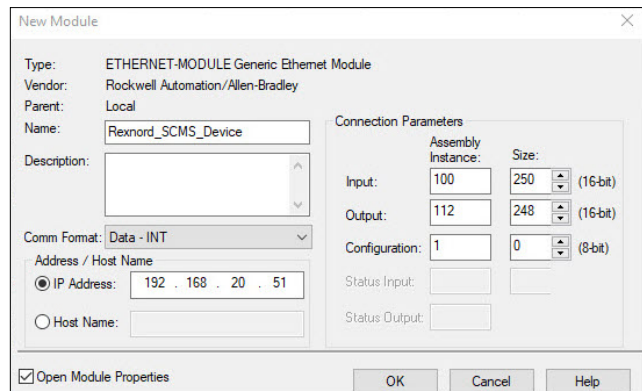
For more information see Rexnord Document [SS3-011](#).

3. ADAPTER CONFIGURATION SPECS

A. THE FOLLOWING LIST IS AN EXHAUSTIVE SPECIFICATION LIST FOR SETTING UP THE EIP ADAPTER IN A PLC

1. LAN connection supports up to 3 Implicit Only Connections
2. LAN connection supports up to 3 Exclusive Owner Connections

3. LAN connection supports Explicit Messaging
4. The Default IP Address is 192.168.20.51
5. When the LAN connection is interrupted and the data cannot be trusted, a value of 0x00000000 will populate into the 32-bit header. If the information can be trusted and the LAN connection is continuous, a value of 0x00000001 will populate into the 32-bit header
6. TCP Port Number is 44818
7. Delivery Option: Unicast
8. RPI: 250 msec
9. Include Status Header: Yes
10. Ethernet I/P Data Model:
 - I. All data is defined as 16-bit data (Data-INT)
 - II. Input Assembly Instance: 100
 - III. Input size (16-bit): 250
 - IV. Output Assembly Instance: 112
 - V. Output Size (16-bit): 248
 - VI. Configuration Assembly Instance: 1
 - VII. Configuration Size (8-bit): 0
 - VIII. First 2 Integers will display the status header

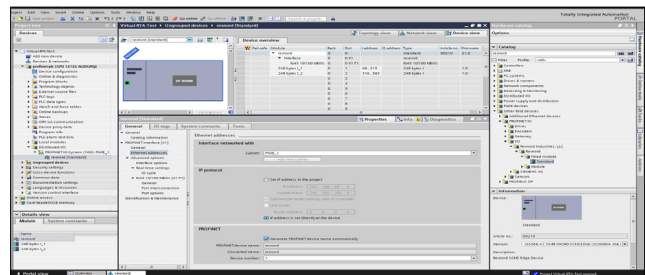


B. THE FOLLOWING LIST IS AN EXHAUSTIVE SPECIFICATION LIST FOR SETTING UP A MODBUS TCP/IP ADAPTER IN A PLC

1. Supports Function Codes: 3, 4, 6, 16, 23
2. Support for 125 registers in a single request
3. Registers are defined as 1-based
4. Registers 1 to 700 are used to move data from the RTA product
5. The registers as defined above will be accessible with either FC3 or FC4
6. Default IP Address 192.168.20.51
7. When the LAN connection is interrupted, and the data cannot be trusted the Edge Device will reply to the Modbus TCP/IP Client with an error code of 0x0B. This error code is a special error code that can be returned, which has a meaning of "Gateway Target Device Failed to Respond"
8. TCP Port Number: 502
9. Modbus TCP/IP Data Model:
 - I. All data will be defined as 16-bit data
 - II. Registers 1 to 700 are used as Input Data

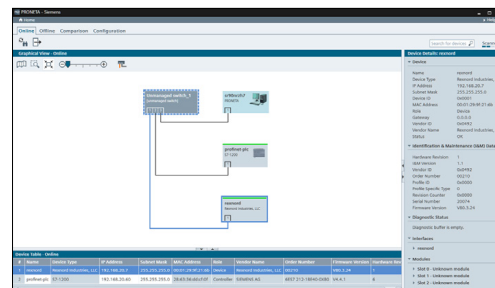
C. THE FOLLOWING PROCEDURE WILL SETUP SIEMENS PLC AS A PROFINET SERVER TO CONNECT TO REXNORD EDGE AS A PROFINET IO DEVICE.

1. Open Siemens PLC project.
2. Add the latest GSD (General Station Description) file provided by Rexnord for the Generation 3 Edge device (request by emailing: Connect.Support@Rexnord.com).
3. Add instance of Rexnord PROFINET IO device to the PLC project.
4. Configure the Rexnord module's slots 1 and 2 to read:
 - bytes slot 1 – 68...315
 - slot 2 – 316...563.
5. Configure Rexnord IO device IP Address as needed by project.



See Appendix for larger example on **page 10**.

6. Download project to PLC.
7. If necessary, configure Edge to use PROFINET PLC Type see document [SS3-011](#) (request by emailing: Connect.Support@Rexnord.com).
8. Perform initial configuration of Rexnord PROFINET IO device name and IP address as required by its usage. For example, use PRONETA.



See Appendix for larger example on **page 10**.

4. DATA MODEL SPECS

A. THE FOLLOWING LIST CAN BE USED TO CHARACTERIZE THE LOCATIONS OF THE DATA MODELED TO THE PLC THROUGH THE REXNORD DEVICE.

1. Data is to be read in entirety in signed integer form.
2. Registers are listed in order of occurrence in the data profile.
3. See table(s) on the following pages for registers.



Models 1150/1050

The following registers are Boolean (Y/N) data imbedded into integers.	
Register 10.0	Amber Andon light is illuminated
Register 10.1	Red Andon light is illuminated
Register 11.0	Oil quality is in a warning state
Register 11.1	Oil quality is in a severe state
Register 11.2	Oil temperature is in a warning state
Register 11.3	Oil temperature is in a severe state
Register 11.4	Oil relative humidity is in a warning state
Register 11.5	Oil relative humidity is in a severe state
Register 11.6	Oil level is in a warning state
Register 11.7	Oil level is in a severe state
Register 12.0	Overall vibration is in a warning state
Register 12.1	Overall vibration is in a severe state
Register 12.2	Gear mesh vibration is in a warning state
Register 12.3	Gear mesh vibration is in a severe state
Register 12.4	Shaft alignment is in a warning state
Register 12.5	Shaft alignment in a severe state
Register 12.6	Bearing vibration is in a warning state
Register 12.7	Bearing vibration is in a severe state
Register 14.0	Edge disconnected from internet
Register 14.1	At least one sensor is not working

The following registers are to be kept as integers.	
Register 100	Average relative humidity of the oil as a percent
Register 101	Oil temperature in degrees Centigrade
Register 102	Oil Quality as a percent, 100% = new
Register 103	Estimated number of hours left before oil should be changed will read 999 when greater than one month remaining
Register 104	Current transformer value in amperes
Register 105	RPM value of output shaft
Register 106	Ambient temperature in degrees Centigrade
Register 107	Vibration in percent, 20% minimum = OK.
Register 108	Inboard bearing temperature in degrees Centigrade
Register 109	Outboard bearing temperature in degrees Centigrade

The following registers are additional registers that only apply to V-Class Drives and are Boolean (Y/N) data imbedded into integers.	
Register 13.0	Inboard bearing temperature measurement is in warning state
Register 13.1	Inboard bearing temperature measurement is in severe state
Register 13.2	Outboard bearing temperature measurement is in warning state
Register 13.3	Outboard bearing temperature measurement is in severe state

Note: Register values that are "unknown" are represented by specific values. This occurs when there is a missing or broken sensor. Most values are only positive values so a -1 or bit pattern 0xffff is the value that is used to represent a value that is "unknown", with the following exception:

- Temperature values that are unknown are represented with the value -99 degrees Centigrade

Models 1130/1030

The following registers are Boolean (Y/N) data imbedded into integers.	
Register 10.0	Amber Andon light is illuminated
Register 10.1	Red Andon light is illuminated
Register 11.0	Oil quality is in a warning state
Register 11.1	Oil quality is in a severe state
Register 11.2	Oil temperature is in a warning state
Register 11.3	Oil temperature is in a severe state
Register 11.4	Oil relative humidity is in a warning state
Register 11.5	Oil relative humidity is in a severe state
Register 12.0	Overall vibration is in a warning state
Register 12.1	Overall vibration is in a severe state
Register 14.0	Edge disconnected from internet
Register 14.1	At least one sensor is not working

The following registers are to be kept as integers.	
Register 100	Average relative humidity of the oil as a percent
Register 101	Oil temperature in degrees Centigrade
Register 102	Oil Quality as a percent, 100% = new
Register 107	Vibration in percent, 20% minimum = OK.
Register 108	Inboard bearing temperature in degrees Centigrade
Register 109	Outboard bearing temperature in degrees Centigrade

The following registers are additional registers that only apply to V-Class Drives and are Boolean (Y/N) data imbedded into integers.	
Register 13.0	Inboard bearing temperature measurement is in warning state
Register 13.1	Inboard bearing temperature measurement is in severe state
Register 13.2	Outboard bearing temperature measurement is in warning state
Register 13.3	Outboard bearing temperature measurement is in severe state

Note: Register values that are "unknown" are represented by specific values. This occurs when there is a missing or broken sensor. Most values are only positive values so a -1 or bit pattern 0xffff is the value that is used to represent a value that is "unknown", with the following exception:

- Temperature values that are unknown are represented with the value -99 degrees Centigrade



Model 1120/1020

The following registers are Boolean (Y/N) data imbedded into integers.	
Register 10.0	Amber Andon light is illuminated
Register 10.1	Red Andon light is illuminated
Register 11.0	Oil quality is in a warning state
Register 11.1	Oil quality is in a severe state
Register 11.2	Oil temperature is in a warning state
Register 11.3	Oil temperature is in a severe state
Register 11.4	Oil relative humidity is in a warning state
Register 11.5	Oil relative humidity is in a severe state
Register 11.6	Oil level is in a warning state
Register 11.7	Oil level is in a severe state
Register 14.0	Edge disconnected from internet
Register 14.1	At least one sensor is not working

The following registers are to be kept as integers.	
Register 100	Average relative humidity of the oil as a percent
Register 101	Oil temperature in degrees Centigrade
Register 102	Oil Quality as a percent, 100% = new
Register 103	Estimated number of hours left before oil should be changed will read 999 when greater than one month remaining
Register 104	Current transformer value in amperes
Register 105	RPM value of output shaft
Register 106	Ambient temperature in degrees Centigrade
Register 108	Inboard bearing temperature in degrees Centigrade
Register 109	Outboard bearing temperature in degrees Centigrade

The following registers are additional registers that only apply to V-Class Drives and are Boolean (Y/N) data imbedded into integers.	
Register 13.0	Inboard bearing temperature measurement is in warning state
Register 13.1	Inboard bearing temperature measurement is in severe state
Register 13.2	Outboard bearing temperature measurement is in warning state
Register 13.3	Outboard bearing temperature measurement is in severe state

Note: Register values that are "unknown" are represented by specific values. This occurs when there is a missing or broken sensor. Most values are only positive values so a -1 or bit pattern 0xffff is the value that is used to represent a value that is "unknown", with the following exception:

- Temperature values that are unknown are represented with the value -99 degrees Centigrade

Model 1110/1010

The following registers are Boolean (Y/N) data imbedded into integers.	
Register 10.0	Amber Andon light is illuminated
Register 10.1	Red Andon light is illuminated
Register 11.2	Oil temperature is in a warning state
Register 11.3	Oil temperature is in a severe state
Register 12.0	Overall vibration is in a warning state
Register 12.1	Overall vibration is in a severe state
Register 14.0	Edge disconnected from internet
Register 14.1	At least one sensor is not working

The following registers are additional registers that only apply to V-Class Drives and are Boolean (Y/N) data imbedded into integers.	
Register 13.0	Inboard bearing temperature measurement is in warning state
Register 13.1	Inboard bearing temperature measurement is in severe state
Register 13.2	Outboard bearing temperature measurement is in warning state
Register 13.3	Outboard bearing temperature measurement is in severe state

The following registers are to be kept as integers.	
Register 101	Oil temperature in degrees Centigrade
Register 107	Vibration in percent, 20% minimum = OK.
Register 108	Inboard bearing temperature in degrees Centigrade
Register 109	Outboard bearing temperature in degrees Centigrade

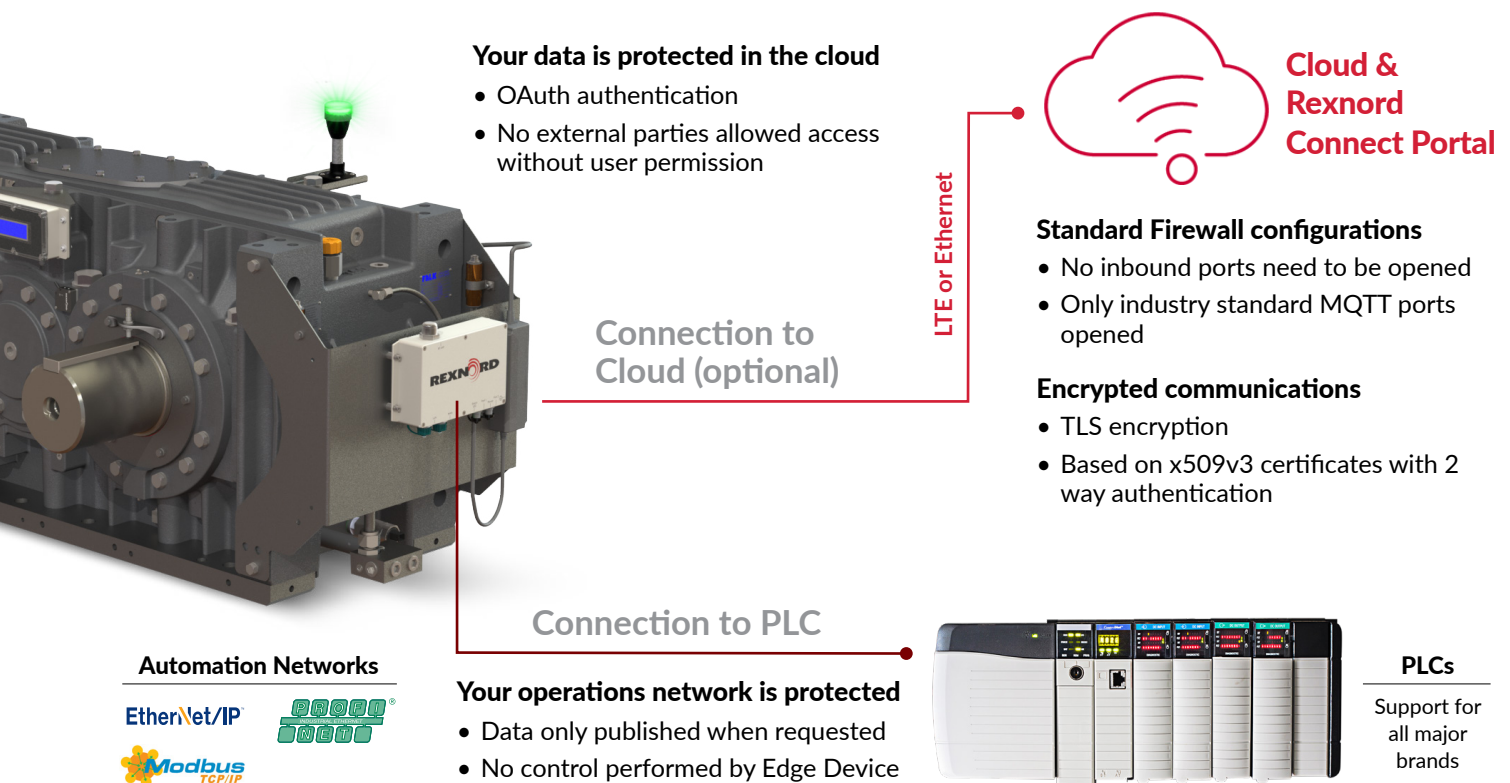
Note: Register values that are "unknown" are represented by specific values. This occurs when there is a missing or broken sensor. Most values are only positive values so a -1 or bit pattern 0xffff is the value that is used to represent a value that is "unknown", with the following exception:

- Temperature values that are unknown are represented with the value -99 degrees Centigrade

5. FREQUENTLY ASKED QUESTIONS REGARDING EDGE TO PLC COMMUNICATIONS

Questions	Answers
How often does the Edge send information to my PLC?	The Edge only responds to PLC requests for information. Nothing is sent from the Edge to the PLC unless requested. The Edge has an internal data gateway that acts as a buffer for communications. The Edge will update this buffer with new data based on the operating conditions and alert status of the asset being monitored. The PLC can requests this data as often as desired, and the gateway will send the information to the PLC. The Edge updates the values in the register approximately every minute.
I am concerned about impacting my network with Edge communications. How do I minimize this?	The packet from the Edge to the PLC is very small. It was designed to pass along the bits that represent the "Warning" and "Severe" alert status, and the integer values for Relative Humidity; Oil Temperature; Oil Quality %; Oil Quality Time Remaining; Motor Current; Output Shaft Speed; Ambient Temperature; Vibration %; and the Inboard and Outboard Bearing Temperature. If this small amount of information is fetched at a cadence of once per second (as the values do not change rapidly) it is unlikely to noticeably affect the communications network.
I am concerned about any external device affecting my control system. How do I ensure that the Edge does not impact my controller?	<p>To the PLC, the Edge looks like an "adaptor" — a device that collects data from a number of inputs, and presents the data for the PLC to read. The PLC chooses then what to do with the data. It can display the information on a local or remote HMI screen (human machine interface monitor); it can log the data as a historian, perform trending, or other analysis; or it can use the alert status bits to create local or remote alarms, and the monitored parameters to modify the controlled operations (such as slowing a process that is running to hot, or shutting down a process where the monitored asset is running in a "severe" condition). It is up to the operator to include or exclude the information from the Edge to the control program, like information from any other sensor.</p> <p>As was indicated above, the way that the Edge communicates to the PLC is through a data gateway that serves to isolate the PLC from any direct communications to anything but alert status and critical parameter data. The Edge, and the cloud that the Edge communicates to, have no ability to send commands or other communications to the control system. This is part of the security designed into our system. For further information regarding data security, please reference "Security" on page 9.</p>
What is the physical media I can use to connect the Edge to my PLC?	The Edge is equipped with a sealed RJ45 connector for its interfaces to both the cloud and the local PLC. For applications where the control system is located remotely, or fiber optic based, adaptors for ethernet to fiber conversion can be used.

6. SECURITY



Risk Assessment

Rexnord follows the industry standard Center for Internet Security Risk Assessment Method (CIS RAM) for assessing cyber security risks across all components of the Rexnord IIoT ecosystem. CIS RAM is aligned with ISO 27005 and NIST SP 800-30 to insure reasonable and appropriate implementation of security controls to satisfy a Duty of Care Risk Analysis for compliance with regulatory (NIST 800-171 standard and the Cyber Security Framework) as well as legal requirements. **The scope includes the Smart Condition Monitoring System platform, cloud systems, network server, workstations/desktop support and security teams. Risk assessments are not shared externally.**

Contact Information

Email: Connect.Support@Rexnord.com

Phone: 1-866-REXNORD (739-6673)

Internet: www.rexnord.com



7. APPENDIX

Screen samples from Page 3.

