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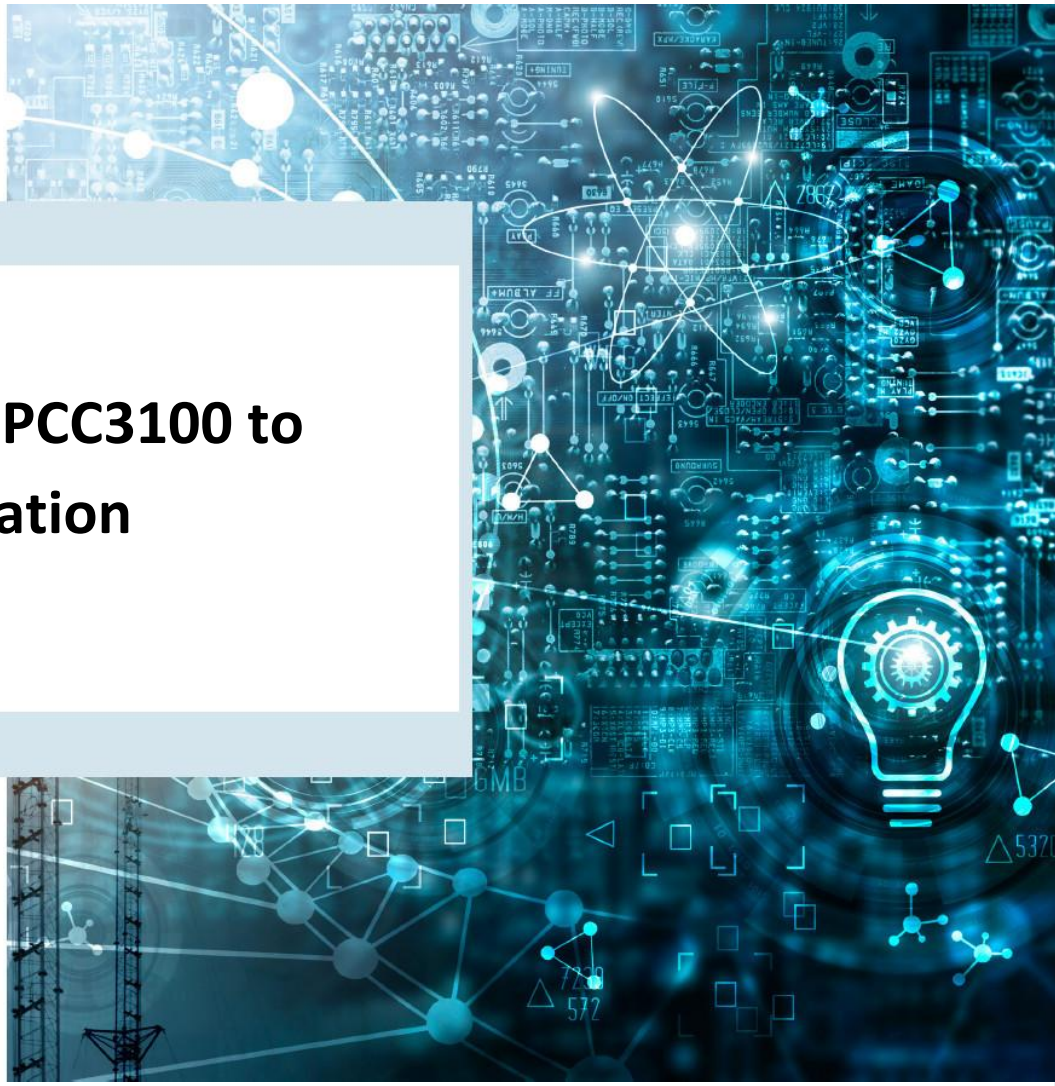


Case Study

Cummins PCC3200-PCC3100 to Modbus TCP Integration

Overview

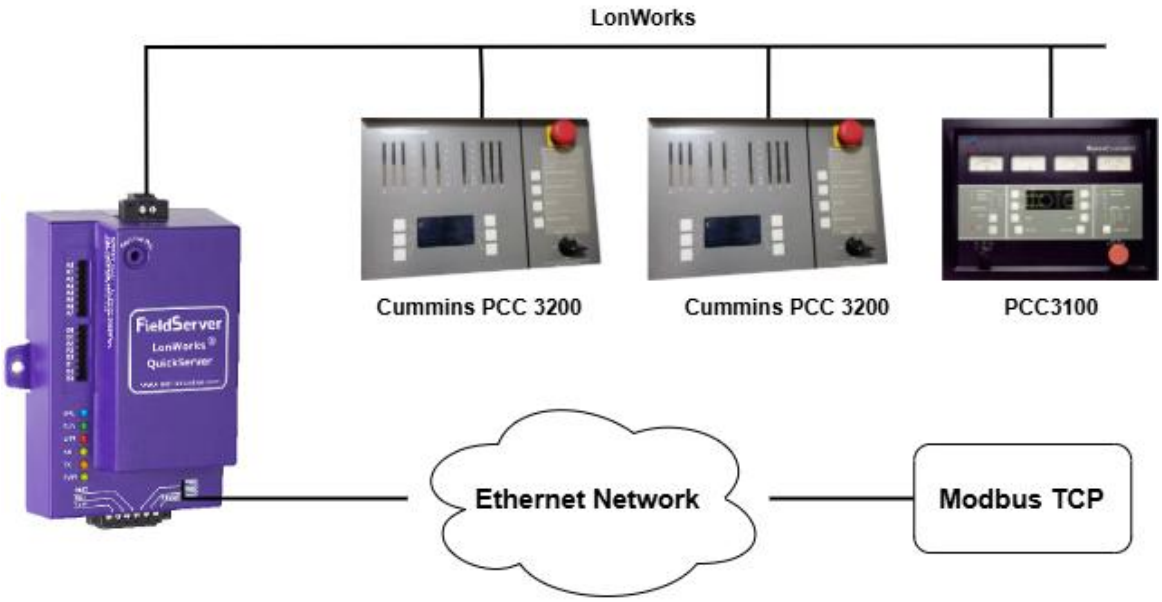
SpaceX was looking to integrate Cummins PCC3200 and PCC3100 generators into their Modbus TCP-based monitoring and control system. The challenge was that these generators communicated via LonWorks, and the client lacked the necessary tools and knowledge to extract essential network data for integration. Chipkin provided expertise, tools, and troubleshooting to ensure seamless communication between the systems.

Unique Aspects of the Integration:

- **Lack of Existing Network Information:** The Clients lacked access to knowledge and tools required to retrieve the information needed to complete the integration such as the XIF file and address parameters such as Neuron ID, Node Id, Subnet ID…. Etc.
- **Connectivity Issues:** Identifying the correct pinouts for the PCC3200 Cummins device was challenging.

Chipkin's approach to the solution

Chipkin deployed the QuickServer Gateway (FS-QS-1011-0154), a protocol conversion device that translates LonWorks into Modbus TCP. Chipkin provided a Laptop with a USB to LonWorks adapter and pre-installed LonWorks tools such as NodeUtil, a specialized software tool used to extract the XIF file. Below is the Network diagram for Integration.



Challenges & Solutions:

1. **Challenge: Lack of Existing Network Information**
    - The client lacked access to critical network data, including the XIF file required for configuration, and faced difficulties establishing proper connections to the PCC3100 Cummins devices due to unclear pinout configurations.

    Solution:

    - Chipkin provided a loaner LonWorks laptop preloaded with NodeUtil, a specialized tool for extracting the XIF file.
    - Through remote access, Chipkin retrieved the necessary XIF file from the Cummins Generators and developed an appropriate configuration file.
    - Through a thorough examination of the board structure, Chipkin was able to determine the correct pin assignments, successfully resolving connectivity issues.

2. **Challenge: Device Communication Failures & System Integration**
    - Initial testing revealed that while some devices responded correctly, one generator, PCC3100, remained unresponsive.

    Solution:

    - Chipkin performed comprehensive troubleshooting, including:
        - Running NodeUtil to verify network configurations.
        - Checking domain, subnet, and Neuron ID settings.
        - Testing alternative communication methods.

- Conducting remote diagnostics and exchanging detailed reports with the client.

- After multiple iterations of the configuration, communication was successfully established.

Outcome and Real-World Implications

Chipkin successfully resolved the client's integration challenges by loaning them a LonWorks laptop preloaded with NodeUtil, which played a crucial role in retrieving the essential configuration data needed for the integration. This allowed the client to overcome the lack of network information and connectivity issues. Combined with Chipkin's expertise in protocol conversions and remote technical support, this approach ensured that all three generators were fully integrated and operational within the Modbus TCP system. This project highlights Chipkin's ability to provide not just technical solutions but also the necessary tools to support complex industrial automation needs.