



DeviceNet to EtherNet/IP Network Migration

Project Background

Client: Tier 1 Miner
Date: June 2026 - September 2026
Location: Pilbara Region, WA

Background

DeviceNet is a legacy fieldbus architecture that many operators are progressively retiring in favour of EtherNet/IP. EtherNet offers a number of distinct advantages over DeviceNet which include:

- Plug and play configuration
- Faster Data Speeds
- Larger Data Payloads
- Greater network capacity
- Lower hardware costs

GTE were engaged on this project to engineer the migration of the DeviceNet Network on a reclaimer and stacker to EtherNet/IP. The scope of the project included engineering design, preparation of drawings, supply of hardware, and commissioning support for the cutover during a planned shutdown.

Each machine had its own dedicated PLC and has a set of field devices distributed along the boom, the cable reeler and the hose reeler. The boom encoder and the digital I/O blocks in the cable reeler and hose reeler marshalling panels communicated with the machine PLC over DeviceNet, bridged into the control system through an Anybus gateway.

The Challenge

The existing DeviceNet Network arrangement presented several problems:

- **Hardware Obsolescence:** The DeviceNet CompactBlock I/O modules and the Anybus gateway are end-of-life technology, with diminishing spares and vendor support and a growing risk of an unplanned outages on production-critical machines
- **Single Point of Failure:** All Network devices reached the PLC through one protocol gateway, so a gateway fault could take the boom encoder and both reeler I/O blocks offline at once.
- **Boom Protection Dependence:** The boom position encoder, a key input to the machine's boom protection scheme, sat on the obsolete network. Our client wanted the protection scheme improved, not just preserved.
- **Brownfield Constraints:** Any replacement had to align to the existing ControlLogix PLC and Citect SCADA platform, comply with client standards, align to other in-flight projects and conform to client

change management processes, and be installed and commissioned within a single shutdown window.

- **Overlapping Works:** The migration shared battery limits with a concurrent MCC upgrade (also being executed by GTE), so the two scopes had to be designed together to avoid conflicting drawing revisions, duplicated panel work and interface gaps during the shutdown.
- **Procurement Timing:** Long-lead EtherNet/IP hardware had to be on site before the shutdown, yet the detailed design and final Bill of Materials could not be completed until after order placement. Our client also needed commissioning spares and operational spares included so that the machine could be supported from day one.

The Solution

The DeviceNet Network devices on the two machines were replaced with native EtherNet/IP hardware, eliminating the protocol gateway and bringing the reeler I/O and boom encoder directly onto the machine's Ethernet control network.

GTE delivered the migration end to end: the engineering design, the procurement of the hardware components, the PLC and SCADA modifications, network configuration and change-management support, off-site testing, the cutover documentation, and the control system, electrical and industrial network commissioning during the shutdown. Site installation was carried out by third-party electrical contractors under GTE's technical governance.

Key Features

1. Gateway-free EtherNet/IP Rrchitecture

The Anybus DeviceNet gateway was deleted from the design. Field devices now communicate natively over EtherNet/IP removing the single point of failure and a layer of protocol translation, and simplifying diagnostics and future maintenance.

2. Flex 5000 Remote I/O at the Reeler Marshalling Panels

DeviceNet 16-point digital input blocks were replaced with Allen-Bradley Flex 5000 EtherNet/IP remote I/O assemblies

Project Outcome

The cutover was executed seamlessly during a shutdown, and both the machine migrations were brought into service successfully, with positive feedback from the client.

Key Achievements:

- Obsolete DeviceNet Network hardware replaced with supported, standards-compliant EtherNet/IP equipment in a single shutdown
- Protocol gateway eliminated, removing a single point of failure from the reeler I/O and boom encoder path
- Boom position brought onto the Ethernet control network with a modern absolute encoder, supporting the improved boom protection scheme
- Spare I/O capacity and operational spares delivered with the package
- Hardware defined, approved and delivered ahead of the shutdown despite the design still being

finalised at order placement

- DeviceNet migration and MCC upgrade engineered as one coordinated package, avoiding rework and interface gaps

The network migration gave our client a supportable, fully Ethernet-based device network on two production-critical machines and set the pattern for retiring DeviceNet networks across remaining machines.

