

case study

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Union Pacific Railroad

www.up.com

Location:
Omaha, NE

Vertical Market:
Transportation

PANDUIT Puts Union Pacific on the Fast Track



Union Pacific Railroad (UP) is a major icon in American history. Well known for the famous event in 1869 where East met West, the joining of the Union Pacific and Central Pacific made the transcontinental railroad a reality.

Steadfast, UP continues to branch out, not only geographically, but in service diversity as well. UP traverses over more than 32,400 miles serving 23 Western and Midwestern states, extending south with six gateways to Mexico and northern interchanges with the Canadian rail

system. More than 8,000 locomotives with over 85,000 freight cars haul chemicals, coal, food, metals, minerals and automobiles. Their nationwide population of 50,000 employees strives to keep their deliveries on track and on time.

When UP outgrew their corporate headquarters in Omaha, Nebraska, the city in which the first rail was laid in 1865, they designed a 1.2 million square-foot facility to house their corporate and administrative offices, as well as consolidate employees from eight other off-site and out-of-state locations. An important factor in the planning, construction, and implementation of this project was an integrated cabling system designed to provide UP with a high-speed, 24/7 reliable voice and data network for a redundant LAN and WAN enterprise.

Union Pacific Railroad

PANDUIT Preferred Products

NETFRAME® Rack System

4 Post Rack System

MINI-COM® ULTIMATE ID®
Patch Panels

OPTICOM® Fiber Enclosures

MINI-COM® TX6™ PLUS
Jack Module

FIBERRUNNER® Routing System

LC Fiber Connector

PATCHLINK™ Horizontal
Cable Managers

EASYMARK™ Labeling Software

MINI-COM® Executive
Series Faceplates

The Challenge

The company's internal Information Technology Systems Group was faced with the challenge of the design, product selection, and implementation of the network. IP Design Group, an Omaha-based technology firm, validated the system design, and became the project manager – from the bid process to the cable plant turnover. "IP Design Group provided industry expertise from their similar large-scale job sites to create construction documents and became an extension of UP's own in-house IT team," states Paul



Norine, Principal for IP Design Group. Design challenges included cabling the backbone around a full-height glass atrium running up the center of the building, as well as, an entire raised floor horizontal environment.

"We were looking for a cabling infrastructure that offered the best overall value, while providing the most network capacity today and scalability for tomorrow," noted Cathy Creath, Principal Consultant, Information Technologies, UP. This included a cabling infrastructure for all voice, data, and video applications, allowing for Voice over IP, as well as E-commerce capabilities to manage their daily one million customer transactions and scheduling activities.

Criteria for Selection

After deciding on a 50-micron fiber optic backbone and Category 6 horizontal cabling, UP then reviewed many products and solutions on the market and proceeded with their own rating and elimination process. The cable properties, such as headroom, loss, and bandwidth were tested at 90 feet, 150 feet, and 280 feet. The top-performing cables were then connectorized in patch panels and workstation jacks and bi-directional testing was performed.

Thorough research, development, and testing are important to UP, which is exemplified through their extensive in-house labs. "The cabling and connectivity products were tested in real-world scenarios, from stomping on the cable, wrapping it around fluorescent lights, to pulling on the connectors to get worse case results," explains Ciro Legamaro, RCDD, Telecommunications Manager, UP.



Why PANDUIT?

"PANDUIT and General Cable were selected based on ease of termination, in-house channel performance testing, overall flexibility and modularity of the cable management products," notes Legamaro. From design to implementation, PANDUIT worked with UP RCDD specialists, IP Design Group, and the selected installation company, Miller Integrated Systems, to provide a product mix that ultimately encompassed 45,000 feet of fiber with 8,000 fiber terminations and over 1,000 miles of horizontal Category 6 cable, with 42,200 MINI-COM® Jack Modules incorporating 21,200 runs and 18,800 patch cords.

The PANDUIT Quality Assurance System requires every PANDUIT jack module to be 100% tested. Each module must meet industry standards as well as PANDUIT in-house performance and reliability criteria, which includes upwards of 90 quality check tests, which are captured and recorded. Once a jack module passes inspections, it is stamped with a Q.C. number for traceability.

The PANDUIT Solution

UP utilized General Cable's NextGen G10X 50-micron multimode fiber, routed through the FIBERRUNNER® Routing System between the racks to provide proper cable support and security. The fiber is terminated with PANDUIT LC connectors into the PANDUIT® OPTICOM® Rack Mount Enclosures housed in the PANDUIT® NETFRAME® System, which allows front and rear access of patching for easy termination. "The new LC connector was selected because of the compatibility with the switches and server," notes Joe Franz, DataComm Specialist for PANDUIT.

The NETFRAME® Rack System was used as the rack solution in the TRs for all copper termination. High-density vertical cable management and horizontal cable managers between patch panels, keep the cables neat and well organized. In addition, the NETFRAME® Racks were outfitted with a grounding strip and common bonding network to ensure reliability and data system performance. "One of the benefits we found in working with PANDUIT was the fast customer service and turnaround in dealing with changes during the construction process," explains Adam Goodwin, RCDD, Technology Specialist for IP Design Group. UP required PANDUIT to alter the vertical channel openings in the front to preserve the bend radius of the copper cable bundles, which were installed in the raised floor and brought up through the NETFRAME® Rack.

"Within 48 hours, PANDUIT delivered a prototype of the re-designed NETFRAME® Rack System, which had been load tested for stress and was ready for placement," adds Ron Frisse, Telecommunications Manager, UP. All cables in the building were terminated with the MINI-COM® TX6™ PLUS Jack Modules.

"The PANDUIT solution has provided us with a cabling infrastructure that met all application requirements"

Neal Spencer, RCDD
*General Director of Telecommunications,
Union Pacific Railroad*

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Adam Goodwin, RCDD
*Technology Specialist for IP Design
Group, Union Pacific Railroad*



Fast Facts

Union Pacific's network includes:

- 4,200 users
- 42,200 MINI-COM® Jack Modules
- 1,000 miles of horizontal Category 6 cable
- 8,000 fiber terminations
- 45,000 feet of fiber



Left to Right: Paul Norine, Joe Franz, Dave McLaughlin, RCDD, Adam Goodwin, RCDD, Steven Schell, Ron Frisse, RCDD, Ciro Legamaro, RCDD

“This job would not have been completed on time if it wasn’t for the ease of termination with the *MINI-COM® TX6™ PLUS* Modules,” states Brian Cooper, Foreman Technician, Miller Integrated Systems.

“There are no special tools required for the connection as the cable simply slides in and the connector clicks and locks,” further explains Legamaro.

“With built-in strain relief, color coding, and minimal untwist, which is better than the allowable one-half inch industry standard, *PANDUIT* takes the failure rate out of the technicians’ hands,” adds Legamaro. “This becomes critical to the integrity of a Category 6 system for maintaining optimal headroom when running at full-duplex capacity,” further adds Frisse.

UP’s horizontal cabling was terminated into *PANDUIT® MINI-COM® Executive* Faceplates, which were sloped for added protection. All General cable and *PANDUIT* termination products, patch cords and pathway products were properly identified and labeled with the *ULTIMATE ID®* Network Labeling Software and durable labels. The *ULTIMATE ID®* System supports the TIA/EIA-606-A standard labeling requirements while providing a clear and efficient way to label network components.

“The entire job ran on track, in part due to the precise pre-planning and open communications, including weekly meetings, between UP and the entire team of vendors and integrators,” states Tom Parks, Miller Integrated Systems. From the product selection to the customer support – the *PAN-NET®* Networking Solution has become the cabling and connectivity standard at UP.

“The *PANDUIT* solution has provided us with a cabling infrastructure that met all application requirements,” states Neal Spencer, RCCD, General Director of Telecommunications, Union Pacific Railroad.

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World-Class Service



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