SIEMENS

Reference

Industrial Communication

Montreal's Métro gets rugged

Siemens partners with a system integrator to help modernize and automate Montreal's subway system by leveraging the unique RUGGEDCOM portfolio from Siemens

La Société de transport de Montréal (STM) is a public corporation responsible for addressing the mobility needs of Quebec's largest city, using both buses and a subway system known as "Métro de Montréal." With 68 stations, Montreal has Canada's busiest subway system, and the third busiest in North America, behind only New York City and Mexico City. More than 1.3 million passenger trips are made each day on Montreal's Métro. Opened in 1966, the system is in the midst of a major, multi-player physical upgrade and technological overhaul.

A transportation company that won the contract commissioned one of their partners, Montreal-based Resologis, to help STM modernize its communications infrastructure. Resologis is a niche software and systems integration company with a team of experts focused on the transportation sector.

Julien Ciesla, President of Resologis, explains that his company's signature offering is known as IPC – Linux-based programmable logic controller (PLC) software. It is designed to automate everything involved in operating a railway – extending from camera security and entrance turnstiles to schedule displays and the public address system. Resologis develops the software for this, but that alone is not enough. Special hardware and a unique computing platform provided by Siemens are also critical elements in enabling a completely functional solution.

The challenge

Provide a complete and reliable solution that is compact enough to fit into small spaces.

Resologis' IPC software needs the associated hardware so that its automation data can flow through the subway's communications network. That means switches must be physically deployed throughout the subway system to work seamlessly with the software. This is easier said than done.

The physical nature of the subway system means that the hardware is exposed to extremely demanding requirements. Mr. Ciesla explains that the very limited space is at the top of the list of the challenges to be addressed. In addition, he notes that subway environments are very harsh, continually exposing equipment to shock and vibration. A lot of dirt enters the equipment, and as a result of Montreal's extreme climate, there's the added difficulty of significant temperature variations.

And at the same time, the devices need to be modular, packed with features, have field-replaceable platforms and be cost effective.

The solution

The modular RUGGEDCOM RX1512 with RUGGEDCOM APE computing platform to run third-party software.

Mr. Ciesla explains how there was only one option when it came to meeting these tough requirements – the RUGGEDCOM RX1512 with Application Processing Engine (APE).

With space being so restricted, there even isn't enough room for two boxes to be mounted side-by-side - one to house the software and one for the switch itself. The RUGGEDCOM RX1512 with RUGGEDCOM APE smartly gets around this issue.

The RUGGEDCOM RX1512 is ultra-compact with a very small chassis, and with the APE, Resologis software code can be literally placed within the RX1512, creating an extremely

Key Specifications

RUGGEDCOM RX1512

Physical ports
- Field-replaceable line modules
- Up to 12 ports 100FX
- Up to 12 ports 10/100TX
- Up to 6 ports 10FL/100SX
- Up to 4 ports Gigabit Ethernet
- Up to 12 serial ports

Physical power supply
- Input voltage range of 10-72 VDC
- Fully integrated power supply (no external adaptors)
- CSA/UL 60950 safety approved to +85°C

RUGGEDCOM APE

- Qualified for operating ambient temperatures of -40°C to +70°C
- Surpasses EN50155 and EN50121-4
- Meets IEC61850-3 and IEEE 1613 electrical specifications for operation under extremely harsh industrial conditions

RUGGEDCOM
RX1512


RUGGEDCOM
APE

compact "single box solution" with the software "under the hood" of the switch.

The RUGGEDCOM RX1512 is highly modular, allowing thousands of configurations. As field-replaceable platform – the device is built for WAN, serial connectivity and Ethernet options. Reliable in harsh environments, it is immune to electromagnetic interference and high-voltage electrical transients, operates in temperatures of -40°C to +85°C without fans, and has an extruded aluminum metal enclosure and 19-inch rack-mount adaptor.

Most compellingly, Siemens is able to deliver a unique, integrated solution.

The APE is available pre-installed with Microsoft Windows 7 Embedded, Linux and CheckPoint GAiA platforms.

Compliant to PC standards, users can install and run their customized operating system as they choose.

This includes being able to extend the life of obsolete and unsupported software by running them on the engine's new and secure operating systems.

The APE provides a one-Gigabit Ethernet link at the front of the unit, and another equal, but completely separate link to the backplane of the RX1512 chassis. This physical separation of the ports and the special arrangement of the connections make it an ideal platform for network and security-related applications, such as security equipment, firewalls, network log and load processors and intrusion sensors – all elements involved in running a communications network for a transportation entity like the STM.

"The racks at each subway station are very small and very narrow," Mr. Ciesla explains, "This means that every unit cannot be much bigger than the switch itself - and in essence, each switch needs to be an industrial computer in its own right.

Only Siemens can offer this solution, where all of the functionality is packed into one small rugged device."

The RUGGEDCOM RX1512 is specifically designed to address harsh environments, such as those encountered in a subway system. Dirt is not an issue. Temperature and humidity extremes are not a problem. Where other switches might fail, Siemens products in the RUGGEDCOM portfolio always continue to operate reliably.

The other key advantage that makes the Resologis-Siemens combination work so effectively is the modularity of Siemens RUGGEDCOM Multi-Service Platform.

"Because it is such a modular platform, it gives us a huge amount of flexibility when addressing STM's needs," adds Mr. Ciesla.

The results

Complete Siemens solution to help deliver cost savings, reduced downtime and simpler maintenance.

Thanks to everything Siemens provided – from its innovative and reliable RUGGEDCOM portfolio to world-class support and flexibility –Mr. Ciesla knows the STM can expect profound and compelling benefits.

"Because the RUGGEDCOM RX1512 is so modular, we have a great deal of flexibility in complying with STM's requirements, no matter how diverse these requirements may be," he explains. "As a result of the modularity, and by being hot-swappable, the cost of maintenance is reduced - and naturally delays caused by maintenance are eliminated."

He adds that the solution's elegance is striking. "We're using standard, off-the-shelf hardware that is rugged and reliable, and yet we can still offer a huge number of customizable features to meet whatever unique application needs there are. And it's so easy and simple to manage it all, with hardware and software platforms that can be efficiently supported for many years to come."

After the prototype was successfully tested, 84 Siemens RUGGEDCOM RX1512 switches with APE will be deployed in Montréal's subway system.

The future

A long-term partnership full of new possibilities.

The introduction of this particular solution is the fruition of years of Siemens and Resologis working closely together. The team at Resologis is not only extremely satisfied with RUGGEDCOM products, they also have a lot of confidence in the Siemens personnel.

"It is much deeper than a supplier-customer relationship," notes Mr. Ciesla. "The support we have had is excellent. If we ever have a problem or a question, they respond in minutes to resolve the issue so that we can move forward."

In addition to the STM project, Resologis hopes to leverage the benefits of RUGGEDCOM Multi-Service Platform for another part of Montreal's transportation system – the city's traffic lights, where the challenges of limited space and a harsh environment are similar, and the benefits of automation just as compelling.

"It's a solution that is very appealing to the City of Montreal," says Mr. Ciesla, adding that the future could hold many more creative Siemens-Resologis solutions brought to the market.

"We've got some exciting years in front of us," he says.

The MR-63 is the first and oldest EMU rapid transit train type operated on the Montreal Métro.

Case study at-a-glance

Customer: Resologis is a Montreal-based niche software and system integrator with a team of experts focused on the transportation sector. A transportation company that won the STM contract commissioned Resologis to help STM modernize its communications infrastructure.

Challenge: to modernize and automate Montreal's subway system, sophisticated communications infrastructure is needed. This includes hardware that can fit into a small space, is durable and able to withstand heat and humidity – and an operating platform that can run third-party software.

Solution: Siemens RUGGEDCOM RX1512 with RUGGEDCOM Application Processing Engine (APE) – it's a compact, cost-efficient utility-grade switch, part of the Multi-Service Platform family of products, with a degree of modularity that makes it ideal for an urban transit system. This is especially due to the fact that third-party software applications can easily run on it.

Results: after the prototype was successfully tested, 84 Siemens RUGGEDCOM RX1512 switches with APE – running the software from Resologis – will be deployed. This solution will ultimately allow Montréal's subway system to be more efficiently and reliably controlled and supervised.

Future: partnership with Resologis has infinite opportunities for delivering significant benefits to Montreal's transportation network – including the city's traffic light system.

Siemens AG
Process Industries and Drives
Process Automation
Postfach 48 48
90026 NÜRNBERG
GERMANY

Siemens Canada Limited
300 Applewood Crescent
Concord, Ontario, L4K 5C7
CANADA

www.siemens.com/ruggedcom

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