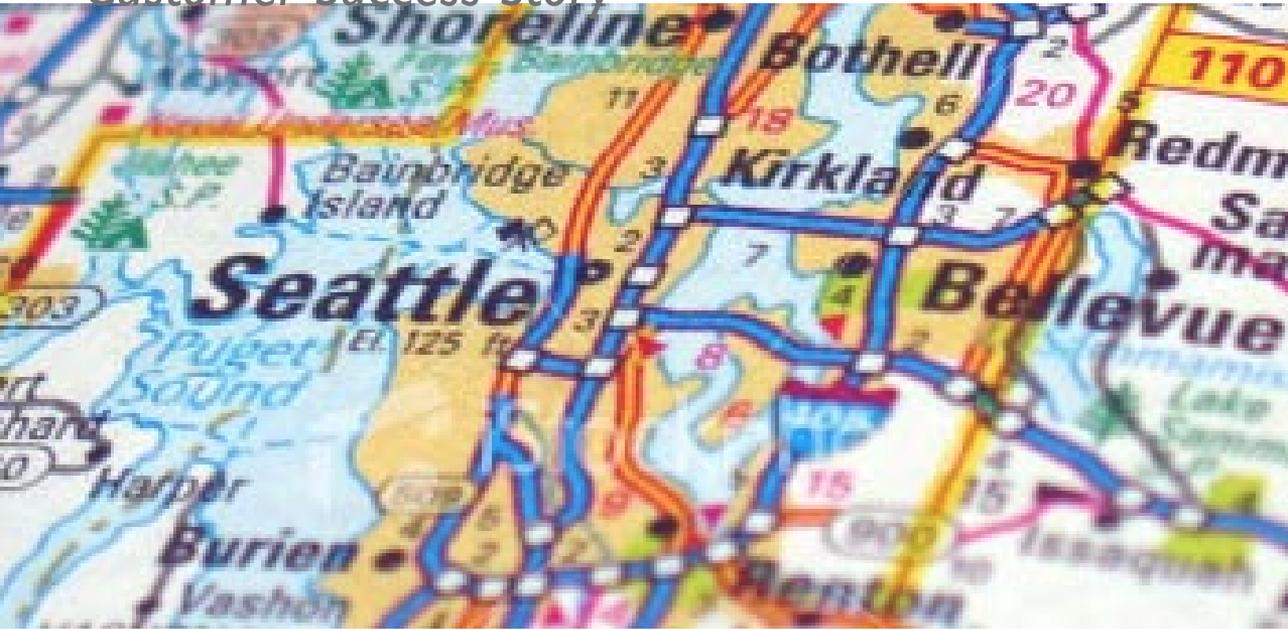*Customer Success Story*

# Ethernet switches

## used on Seattle bus
## fare collection system

# Ethernet switches used on Seattle bus fare collection system

*The ERG Group, a world leader in the development and supply of integrated fare management and software systems for the transit industry, have chosen Westermo Ethernet switches to equip approximately 2500 buses operating in the Central Puget Sound Region of Washington State, around the city of Seattle. The new fare collection system provided by ERG will collect upwards of $250 million in annual passenger revenues from approximately 130 million passenger journeys per year. Low operating voltage and high reliability were the main criteria in the selection of the Westermo Ethernet switches.*

The Central Puget Sound Regional Fare Coordination (RFC) Project features smart card technology that support and link all the fare collection systems of the major transit agencies operating in the Central Puget Sound region of Washington State. This includes King County Metro, Community Transit, Everett Transit, Kitsap Transit, Pierce Transit, Sound Transit and Washington State Ferries. King County is the largest one, gathering approximately 70% of the traffic flow that include buses. The RFC Project will consolidate hundreds of existing fare media in an effort to streamline the management of fare transactions and facilitate cross-jurisdictional and multi-modal trip making in the Puget Sound region.

The RFC Project allows customers to purchase or revalue regional fare cards (smart cards) from multiple outlets (e.g., customer service offices, phone, retail outlets, internet), and enables them to use the smart card on an estimated 2.379 fare transaction processors (2.207 on-board fare transaction processors, 91 stand-alone fare transaction processors,

81 portable fare transaction processors). The fare will be automatically debited from the available funds on the smart card account, and/or the card will be acknowledged as a fixed period unlimited ride pass. Each time a card is used, data relating to the date and time the card is used, the amount of fare paid, any incentives applied, the agency providing the service, the route, and if applicable, the institutional account, is captured and stored electronically. The fare transaction processors have the capacity to access information on the smart card and transfer data to a data acquisition computer. The regional revenue clearinghouse then performs transaction processing, revenue reconciliation, and financial reporting functions for the RFC system.

This new system is currently being installed by ERG with approximately 1000 buses now operating, and with upwards of 1500 more busses to be added later in 2007. Each bus is equipped with ERG's proprietary CP5000 Card Processor and Driver Display Unit (which is the bus driver interface). They then connect to the Westermo Ethernet switch as well as a Cisco wireless communication access point.

One of the key issues for on-board electronic devices in a bus is the low level of operating input voltage required. The SDW-550B that ERG has chosen is an unmanaged Ethernet switch that is designed to be a cost effective solution for harsh environment applications. One of the main characteristics of the Westermo switch is that it has a very wide input power range that goes from approximately 7 to 57 VDC.

*"We chose Westermo primarily due to the low operating voltage with which the device would continue to run. It runs down to around 7 volts which is excellent in a bus operating environment. When you start a bus, the engine cranks and draws a lot current from the battery. As a result, the battery voltage drops and any device that needs 8 or 9 volts may have trouble operating or reset."*

*"Vibration resistance inside of a bus technical box is another challenge. While Westermo's products are dedicated to demanding applications, an inductor and a couple of components have been re-enforced on the board with epoxy so as to ensure the highest levels of reliability"*

Said Christopher JEFFERIES, Deployment Manager at ERG.

*"We particularly appreciated the ability of Westermo and Gross Automation, their US distributor, to customize the product and to give us the right level of technical support we needed. "*

## Application

ERG the ERG Group is a world leader in the development and supply of integrated fare management and software systems for the transit industry, and for its smart card systems and services. The Group has installed systems in major cities throughout the world including Hong Kong, Melbourne, Rome, San Francisco and Singapore with installations in progress in Gothenburg, Seattle, Stockholm, Sydney and Washington DC. ERG has delivered systems that support more than 20 million smart cards in circulation and handle approximately 5 billion transactions per annum. ERG is an Australian-based company, listed on the Australian Stock Exchange and employs 900 people in 11 countries. For more information: http://www.erggroup.com

GROSS AUTOMATION is an import organization and master distributor for North America that is centrally located 100 km north of Chicago in the Milwaukee suburb of New Berlin. They specialize in industrial automation components from both European and domestic suppliers in order to help customers create a more efficient and cost effective industrial process.
For more information: www.grossautomation.com and www.westermosales.com



ERG CP5000 card processor



Westermo SDW-550B Ethernet switch
in a Seattle bus

## A product range to meet every demand

Westermo provides a full range of data communication solutions for such demanding applications as railways, aeronautics, defence, water treatment, substation automation, roads and tunnels. The staff at Westermo can provide the highest levels of service and technical support to help our customers to choose, configure and install the best solution for each specific application requirement. Our knowledge goes far beyond our own product range; we have a unique competence regarding your environment whether it is on a train, in an aeroplane, on the seabed or in a substation. To ensure a close relationship with the customer, Westermo has a local presence in more than 35 countries. The Westermo product line includes more than one thousand different types and versions of our modems, switches, routers, time servers and converters.

## SDW-550 Unmanaged Ethernet Switch

The SDW is a 5 port switch which can be configured with one or two fibre optic transceivers for either multi- or singlemode cables. The switch is a plug and play unit but offers also the possibility that each port can be configured by DIP-switches. The screen of each TX port is individually isolated to help prevent earth loop problems within the network.

⊞ 10/100BaseT (Ethernet)
⊞ Plug and Play
⊞ Port Monitoring
⊞ DIP-switch Configuration
⊞ Extended Ethernet Frames (VLAN, QoS)
⊞ –25 to +70°C
⊞ Tri-Galvanic Isolation
⊞ Full 100 Mbit "Throughput"
⊞ Transparent to large frames (VLAN, QoS)

SDW-550