

## *Customer Success Story*



# *High-security switches*

*for mining-data control and monitoring  
at Fairmount Mineral*



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*Wedron Silica, a subsidiary of Fairmount Mineral has chosen Westermo's high-security Lynx switches for harsh industrial environments. Their application develops a full industrial Ethernet redundancy ring that monitors and controls the entire mining facility. Lynx switches have a 20 ms reconfiguration time; the world's best off-the-shelf performance for Ethernet switches.*

Fairmount Minerals is one of the largest producers of industrial sand in the United States. Its Illinois based subsidiary, Wedron Silica, has been in operation for over 100 years, producing high-purity, round-grain silica sand. This sand is mined from the St. Peters Sandstone which is a 200 million-year-old sand deposit that runs from Minnesota to Oklahoma. More than 50 hourly and 10 supervisory personnel manage the production of approximately 10,000 tons of sand each day. The Wedron facility's biggest producing segment is for the fracturing sand market. Hydraulic fracturing sands, known as 'frac sands', consist almost entirely of quartz or silica sands and are used as proppants in oil and gas wells. Frac sand treatment is the forcing of a concoction of frac sands, viscous gel, and other chemicals down a well to prop open fractures in the subsurface rocks thus creating a passageway for fluid from the reservoir to the well.

The Wedron Silica plant operates 24 hours a day, 7 days a week.

All production is managed through an industrial Ethernet network. This network exchanges data from hydraulic high pressure mining canons. Additionally, data from cameras linked to the control center via fiber-optics help to control and adjust truck loading as well as the sand drying rooms. The data monitoring and control systems need to be of the highest reliability levels, specifically in such a harsh industrial environment as mining.



"Our data network has been working using the Ethernet protocol for 10 years, but this is the first time that we have installed a full redundancy ring" says Frank BARNES, Technical Manager at Wedron Silicate. "There were several reasons for choosing Westermo's Lynx range of switches, like the strong harsh environment compliancy, the off-the-shelf redundant ring capability, and the world's fastest data recovery time of 20 ms. Particularly, we appreciate the easy configuration and monitoring of the switches as well as the no-charge software updates. We have also had very close technical collaborations with Trond GRENDAR from Westermo and Doug SMITH of the John R. Willis company, an independent manufacturer's representative for Gross Automation, Westermo's distributor in North America", adds Barnes.

The ring portion of the network consists of 11 of the Lynx 1400-series switches with 6 Lynx 400-series switches on branch runs. The ring switches are located in the plant process buildings and are named for their location. All are mounted in dust tight boxes and powered by (2) 24 VDC power supplies that are connected to a battery backup. The ring network is kept powered for over 2 hours in the event of a power outage. All of the control and monitoring information is passed on Westermo's network.

Westermo's L1400 and L400 support IGMP protocol (Internet Group Management Protocol) provides filtering techniques to control the flow of data around the ring in such a way as to optimise the bandwidth, and furthermore, to secure the network operation. IGMP is used by IP hosts to dynamically register membership in Multicast groups to the closest multicast router. Multicast routers periodically send out a "Host Membership Query message" to remain updated on group membership for the local network. In order to efficiently use the bandwidth and cut down on traffic, multicasting is the ideal solution. When data needs to be sent to a large amount of users on the network, the data will be sent simultaneously to the specified users via multicasting, and not just blanketed to all users. IGMP snooping requires the switch to examine, or snoop, some Layer 3 information in the IGMP packets sent between the hosts and the router. When the switch hears the IGMP host report

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from a host for a particular multicast group, the switch adds the host's port number to the associated multicast table entry. When the switch hears the IGMP leave group message from a host, it removes the host's port from the table entry. The Lynx-series has the IGMP Server (router) implemented, which means that no external IGMP server on the network is necessary. It is also integrated with the FRNT feature, which means that the multicast filters will be updated within 20 ms in case of any network failure.

The Lynx switches fully support QoS (Quality of Service) with four priority queues and strict priority scheduling as well as HoL (Head of Line Blocking Prevention). This is also a key issue for process applications such as Wedron's, because it achieves determinism for real time critical applications.

The 400 and 1400 Lynx switches have a military design with a full metal housing (IP 40). They operate under a wide temperature range from -40 to +158°F and have a wide DC power range from 19 to 60 VDC. They have no moving parts or electrolytic capacitors, low power consumption with redundancy, are DIN rail mounted and support long cable.



*"This first successful implementation with Westermo's flagship line of Lynx switches will probably lead to many new business opportunities inside the group," sums up Frank BARNES. "This application positions Westermo as the industry leader in complex network management for harsh industrial environments – all this while remaining cost-effective against possible competing technologies," adds Bob GROSS, President of Gross Automation, based in Milwaukee (WI). "We are proud to be members of the Westermo team!"*

**FAIRMOUNT MINERALS**, headquartered in Chardon, Ohio, is one of the largest producers of industrial sand in the United States. Fairmount Minerals' Wedron Silica Company has been in operation over 100 years producing high-purity, round-grain silica sand. This sand is mined from the St. Peters Sandstone, which is a 200 million-year-old sand deposit that runs from Minnesota to Oklahoma. Wedron Silica's grades are of extreme purity (>99.5% SiO<sub>2</sub>) and range from a coarse sand of 21 AFS/GFN up to a very fine sand of 125 AFS/GFN.

For more information: [www.fairmountminerals.com](http://www.fairmountminerals.com)



## 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.

### Lynx Series – Compact high performance switch

The Lynx is a family of switches with different function levels and approvals. The switch can be configured with either 100 Mbit or Gbit transceivers offering transmission ranges up to 120 km. The Lynx is managed with four priority queues and features like Head of Line to blocking prevention ensure that the data is deterministic. The 400 and 1400 models are also equipped with the FRNT and RSTP redundancy protocol.

- ⌘ Real time Ethernet
- ⌘ Priority queues and priority scheduling
- ⌘ FRNT/RSTP redundancy protocol
- ⌘ Extensive line protection
- ⌘ Wide temperature range (-40°C to +70°C)
- ⌘ Galvanic isolation and transient protection

