NEWS

requirements grow, you can add 1-gigabit-per-second encryptors," says Ribordy. SmartQuantum is getting a similar integration project under way, using classical encryptors from two companies, which Guignot would not name.

For ID Quantique, integrating classical and quantum cryptography involved two steps. One was to develop a secure way of transferring the key from the quantum device to the classical one. The other was to come up with protocols for handling errors in the transmission and for synchronizing the two types of devices.

MagiQ, on the other hand, took a different path. It built its own integrated device through a partnership with Cavium Networks, in Mountain View, Calif., a maker of encryption/decryption microprocessors. Its 2-Gb/s product is scheduled for certification by the U.S. National Institute of Standards and Technology in 2007. And the company is pressing ahead on the bandwidth front, with an 8-Gb/s device due for production this month.

Even if their products are ready for the market, the market may not be ready for them. Banks, prime targets of ID Quantique, have only recently warmed to the idea of encrypt-

A Robotic Sentry For Korea's Demilitarized Zone

Go ahead, make its day.

A new gun-toting sentry robot, developed by Samsung Techwin Co. for the South Korean government, may soon be coming to a disputed border near you. The SGR-A1 robot uses a low-light camera and pattern recognition software to distinguish humans from animals or other objects and, if necessary, can fire its built-in machine gun—a Daewoo K3.

ing their data while it's in transit, let alone using a new technology to do so.

Still, SmartQuantum's Guignot believes that there could be a €300 million market by 2009 for quantum cryptography companies, but only if they convince telecom providers to make sales for them. Say a bank wants to securely link its London and Paris offices. A telecom company would install hybrid encryptors within the telecom network. Then the provider could lease the bank a hybrid encryptor and an optical-fiber connection to the network, giving the bank essentially impenetrable encryption along the entire path. "This would be a premium product," says MagiQ CEO Robert Gelfond. He thinks providers could charge up to 30 percent more for a line like that.

The one hitch is that because commercial quantum key distribution works only over a maximum distance of 100 to 140 kilometers of fiber, the telecom provider might have to link several key distributors end to end within its network and guarantee that no one can gain access to the connection points. MagiQ has already taken the first step along this path. A year ago, it collaborated with U.S. carrier Verizon to demonstrate key distribution and data encryption over two linked 80-kilometer spans.

— SAMUEL K. MOORE

Myung Ho Yoo, a principal research engineer at Samsung's Optics & Digital Imaging Division in Seongnam City, just southeast of Seoul, says the robot is the first of its kind to be commercialized. South Korea's need for such a robot is clear, he says. Unlike the border between the United States and Mexico or even those separating Israel from the occupied territories, the demilitarized zone that stretches for 250 kilometers between South and North Korea is patrolled along its entire length. With one guard post every 50 meters along the southern side, two guards per post, and twelve shifts per day, the man-years spent on guard duty quickly add up.

The Samsung robot packs a 5-millimeter, Korean-made light machine gun. Should it detect an intruder, "the ultimate decision about shooting should be made by a human, not the robot," says Yoo, who led the team that designed the robot. But the robot does have an automatic mode, in which it can make the decision.

The machine's real innovation is its color camera, which can pinpoint a target from up to 500 meters away in illumination down to 0.008 lux (lumens per square meter), about the same as a starlit night. The robot has three such cameras, two of which work in stereo for surveillance and tracking while the third zooms in for targeting. A digital video recorder captures data for up to 60 days at a time. By calling up the robot's ID number, operators back in Seoul can also see in real time what is happening in the field.

For use in the DMZ, the sentry bot doesn't need to distinguish friend from foe. "When you cross the line, you're automatically an enemy," Yoo says. He wouldn't say whether the robot has actually been deployed in the DMZ but did note that units are currently being assembled and tested at the company's factory in Changwon, near Pusan. Samsung is also looking to deploy the robot—minus the gun, but perhaps with some sort of nonlethal weapon—at airports, prisons, and nuclear power plants, among other places. There's no price tag as yet, but Yoo estimates it will be in the US $80 000 to $100 000 range.

By deploying the robots, Yoo thinks his government may be able to significantly reduce the mandatory two years of military service that all young Korean men now serve. His own son is a freshman in college and will soon be eligible for the army. "My son likes this robot," he says.

—JEAN KUMAGAI

KIM DONG-JOO/AFP/GETTY IMAGES