



# Thailand: Saving lives with GPRS technology

**On December 26, 2004, a tsunami triggered by a maritime earthquake in the Indian Ocean resulted in extreme devastation. While this catastrophe could be labeled a once-in-a-lifetime event, mudslides are an omnipresent threat that claims lives every year. In May 2006, more than 100 people were killed by a mudslide that was the direct result of continuous deforestation and heavy rainfalls of up to 330 l/m<sup>2</sup>.**

Getting a handle on mudslides would be easy in theory: simply plant more trees. This is unfortunately a very long-term approach to this problem, and erosion of the ground where trees are not present has a very negative immediate effect. At present, Thailand's government is concentrating on being able to evacuate the population out of danger zones. An early warning system is supposed to ensure enough time for this evacuation. Thailand's efforts can be traced back to 2005, when the "Forestry Research Database Center" at the Kasetsart University in Bangkok was directed to set up an early warning system.

## **Requirements for the early warning system**

The initial prototype radioed predictive data such as the amount of precipitation, ground humidity, air temperature, and air humidity to a central observation post. The antenna towers used for the radio connection were extremely expensive, however. To reduce costs, there was an early switch to GPRS- (General Packet Radio Service) and satellite-based communication.

One of the most important demands on the local stations is being able to provide

data if communication is lost. Up to 7 days of recorded data must be able to be sent to the central headquarters once communication has been reestablished. An on-site text display with function keys allows data to be retrieved there as well.

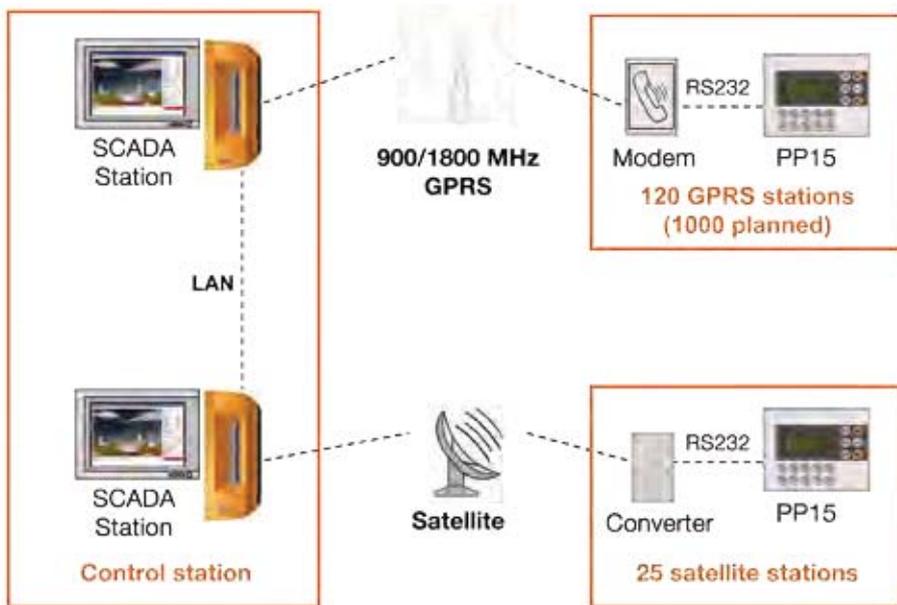
## **Choosing B&R**

After the first GPRS prototype from a local manufacturer failed to meet requirements, it became clear that the only solution possible was a professional system that used tested software and extremely reliable hardware.

Because they had offered a very adaptable GPRS solution that had proven itself in similar projects, Industrial Technology Supply was selected to handle the telemetry of the system.

A Power Panel PP15 device from B&R was chosen as the hardware. The advantages are obvious:

- Integrated controller, HMI, and I/O substantially simplify on-site installations.
- Integrated analog inputs - configurable for both KTY10-6 and PT1000 sensor types - minimize costs and installation times.



- Modern programming languages make it possible to implement projects easily and efficiently.

### How it works

When the PP15 is in “online mode”, the values measured by the sensors are provided to the Modbus slave handling the communication in real time. The SCADA server in the control center polls the data via GPRS or satellite every 15 minutes (more often during heavy rains). The PP15 device is used to cyclically monitor the status of the modem and switches to “offline mode” automatically if the network fails.

When the PP15 is in “offline mode”, the measured data is time-stamped and stored to flash memory every 15 minutes. Once communication is reestablished, it switches to “recovery mode” automatically.

When the PP15 is in “recovery mode”, the large blocks of data in flash memory are sent to the control center. Once all data has been transferred successfully, the PP15 switches back to “online mode”.

### The SCADA server

In the control center, all of the data is collected in an MS SQL database and evaluated using mathematical models. The following measures are taken depending on the risk of a potential mudslide:

- First warning level: Exercise caution
- Second warning level: Prepare for evacuation
- Third warning level: Evacuate to secure zones

These early warning systems are also being used to help mitigate the effects of flooding from Thailand’s rivers and to monitor water pipes in Bangkok. These effective measures are used as the basis for protecting the population.

“We are proud to be able to make a positive contribution to Thailand and are very happy about the results we’ve seen so far,” said Karl-Heinz Pierz, Managing Director at I.T.S. “Even when a mudslide buried one of the stations, to everyone’s surprise the PP15 was still able to transmit data. This is real proof of its high quality.” 

[www.plc-scada.net](http://www.plc-scada.net)

Industrial  
Technology  
Supply Co.,  
Ltd. (ITS)



ITS is managed by Karl-Heinz Pierz, employs 15 people and makes a seven figure Euro annual turnover. The company possesses extensive industry knowledge in industrial branches that are particularly important for Thailand such as foodstuffs, animal feed, as well as the chemical, textile, paper, glass, steel, oil, gas, furniture and agriculture industries. Over time, changing over from old to new controller systems has become the main area of expertise for the company. With a wealth of experience in migrating systems, ITS is in a position to handle replacements of extremely large and complex systems.

With a staff of well-trained engineers, as well as B&R sales and support, ITS offers high quality system integration and excellent support.

Industrial GPRS monitoring and controller systems are the current focus of the company’s automation department. Intelligent stations with B&R controllers and GPRS modems communicate with a central operating station based on the Modbus protocol. The big advantage to conventional radio systems is the very low installation costs because GPRS is based on existing GSM networks with very low monthly fees. Water distribution, flood forecast, pipeline monitoring and tank level monitoring are some of the main applications.



A measuring station of the early warning system.