

## Advantages of Cloud Monitoring of Environmental Conditions

Cloud computing is the latest advancement in the field of remote monitoring of environmental conditions. A cloud-based system makes it possible to collect data from one location and have it be accessible to local client devices over a network and the internet.

With cloud computing, there is a substantial workload shift. The local devices no longer need to run resource-intensive software applications in order to process and share data. Also, devices connected to the cloud don't require as much hardware versus devices with applications running locally.

### How it Works with the Sensaphone Cloud

The Sensaphone cloud (<https://www.sensaphone.net>) is made up of redundant, scalable software applications that communicate with devices, process alarm requests, store sensor data and provide a complete device management user interface. It is accessible from any internet-connected device such as a tablet, computer, smartphone or laptop, and it provides a simple means to check the status of monitored conditions or make configuration changes.

Users need to register with Sensaphone.net to add client devices to their account. The primary account holder is the administrator who can create additional users with full or limited access to specified client devices. All users receive a personalized email login with custom passwords, and they can manage any devices within their account.

### Device-to-Cloud Communication

Each Sensaphone device (e.g., Sentinel) makes an outbound connection to the Sensaphone.net servers. The device communicates by opening an encrypted

SSL/TLS communication session on Port 443 (HTTPS). HTTPS creates a secure channel over an insecure network. This ensures reasonable protection from eavesdroppers and man-in-the-middle attacks.



### Device Connectivity

Client devices can connect to the Sensaphone.net cloud system through a 10/100 Ethernet connection or via cellular connection. Ethernet devices require DHCP (dynamic host configuration protocol) support to obtain an IP address when plugged into the local area network (LAN). Once an IP address is obtained, the device will attempt to connect to the Sensaphone.net cloud system. The online LED on the device will light up when connectivity to the server has been successfully established. If necessary, a static IP address can be assigned to the device once it's online.

## Benefits of Cloud Monitoring

**Cost Savings** — With cloud monitoring, fewer system support calls to the end users are required, which reduces operational expenses and overall IT resources. In addition, cloud monitoring has fewer demanding hardware requirements on the computers that are used to manage the monitoring systems.

**Manageability** — An unlimited number of locations can be monitored from one common user interface. This means that in an alarm situation, personnel can respond faster. They can also more easily manage multiple locations.

**Reliability** — Cloud servers like Sensaphone.net are built from server clusters, which are a group of servers running the applications that manage device connectivity, alarm delivery and user interface. Cloud servers provide higher availability, reliability and scalability over a single server. These clusters are distributed across multiple locations for true redundancy to prevent site failures and downtime caused by natural disasters, power failures or connectivity outages. In addition, hardware failure on a single server will not affect the system's functionality.

**Upgradability** — Because most system features exist in the cloud, upgrades can be released to all users more easily. In addition, the devices contain upgradeable flash memory, so updates can be installed from the cloud either automatically or on demand depending on the users' requirements.

**Mobile Accessibility** — Cloud monitoring provides real-time data and status from any device connected to an internet, cellular or Wi-Fi connection.

**Supervised Connection** — Devices must establish connection to the Sensaphone.net server and send a heartbeat packet every 15 seconds to indicate their connectivity. If this connection is lost for a minimum of 30 minutes, an offline alarm can be configured within the server to notify of a site disruption alarm. The offline timeout is configurable by the end user. Supervised connections are vital to any monitoring system that can be affected by mass power or network outages, theft or natural disasters.

**Security** — Passwords and all data to the site are SSL encrypted. Database access is heavily protected by firewalls, permission restrictions and physical isolation.

## Hybrid Cloud API Architecture

The Sensaphone.net application programming interface (API) is a resource for proprietary products (such as mobile applications) and third-party clients. It uses representational state transfer (REST) architecture over HTTPS using JavaScript Object Notation (JSON) as the data format. HTTP is not supported. The service can be accessed in one of two modes: uniform resource identifier (URI) mode and JSON mode.

Sensaphone designs and builds active remote monitoring and early detection products for a wide range of markets that quickly and effectively provide alerts to problems at remote locations. Over 400,000 Sensaphone systems are in use today around the world with superior customer satisfaction.

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