

OneBase InSite® Connect Business Case



Executive Summary

OneBase InSite Connect is developed as a product to control and monitor several processes, remotely configure site equipment and consolidate alarms for various devices in a remote site. While many base station vendors offer some level of dry contact alarm management, InSite Connect is designed to provide more than just dry contact alarming. It works in conjunction with subsystems from multiple vendors to enable centralized and remote access to those systems for monitoring, configuration, and other actions. The number and types of ports on an InSite Connect RCU (remote control unit) are intended to support a typical variety of devices. Dry contacts provide for basic monitoring while serial, USB, and Ethernet ports provide for remote monitoring and configuration of various selected devices. One such device is an IP remote controllable thermostat installed for energy savings through a passive cooling algorithm, a particularly significant operational cost.

InSite Connect also reduces on-site visits through its ability to monitor, control and reset certain alarms, provide initial problem troubleshooting, better equip dispatched technicians to minimize return trips, remotely configure selected devices in a site, and more efficiently manage energy consumption. The InSite Connect serves as remote eyes-ears-hands in all sites throughout a network. This is truly a solution for many of the challenges faced by CATV operators, or anyone managing a remote network of just about any kind, in difficult economic environments.



Situation Analysis

Problem Description

As networks continue to grow and become more complex, the demand for increased maintenance also grows and it becomes increasingly more challenging to identify ways to make improvements in the efficiency of distributed network infrastructure management. The marketplace has become more competitive and any operating expense saved on network maintenance without compromising network performance goes right to the bottom line. Five key areas with potential expense savings are identified below.

Site Visit Expenses

One key expense associated with infrastructure maintenance regime is the technician workforce.

Technicians visit sites for a variety of reasons. They go to each site many times a year for preventive maintenance. They visit specific sites to address on-site equipment configuration requirements. They also travel to sites to identify and repair specific equipment and often require a second visit to bring the right replacement parts and equipment after identifying the actual cause of the problem. Each visit to a site by a technician costs the operator money and impacts the company carbon footprint.

Sometimes it is difficult to manage site maintenance efficiently to clearly identify recurring problems, what repairs were necessary, and when repairs were done. As a result, it can be very difficult to identify equipment failure patterns to determine where the inefficiencies are and how they can be eliminated.

Energy Related Expenses

A key component that has become more critical to expense management is network energy demand. This will become even more critical as energy costs continue to rise. Studies indicate that a temperature setting reduction of just 1 degree at a single site or use of a fan instead of an air conditioning unit up to a certain site temperature level for site cooling will result in a significant savings over a year's time.

Crime Related Expenses

Crime is also a problem that is becoming increasingly more difficult to manage. Theft and vandalism continue to be a costly problem particularly at remote sites. Monitoring of sites with IP cameras controlled by InSite Connect RCU provides a cost-effective solution to crime and vandalism related problems.

Environmental Issues

Companies, particularly high-profile companies such as network providers are under increasing pressure from the public and governmental agencies to become more "green" in their operations by reducing fuel consumption and carbon emissions. Network providers must find ways to prevent unnecessary site visits and reduce energy consumption at those sites while ensuring proper network operation. By reducing their energy usage, these companies can help protect the environment and save on energy bills, while improving their image with the public as a "green" business.

Other Intangible Problems

Reduction of OpEx goes directly to the bottom line, but over time, finding these OpEx reduction opportunities has become more and more difficult.

Clearly, the benefits associated with OpEx reduction are quantifiable. However, there are other less quantifiable areas of potential improvement.

For example, although difficult to quantify, there is a relationship between hub performance and customer churn. There are times when due to ineffective reporting or alarming capabilities, a network provider is not aware of the fact that a particular site is underperforming and could, therefore, be inducing increased churn which would negatively affect revenue.

Another difficult to quantify cost is related to the effect that inefficient site status reporting has on certain regulatory demands. For example, without a source of data it is very difficult to prove compliance to any regulatory requirements for minimum emergency backup power.

These examples represent opportunities for improved efficiencies, reduced expenses, and increased margin.

Solution Description

The primary objective of this proposed solution is to significantly reduce OpEx and improve the performance and manageability of the network with a quick Return on Investment (ROI).

The solution that is being proposed is the adoption of the CommScope OneBase InSite® Connect system.

The CommScope OneBase InSite Connect system is a comprehensive turnkey system designed to fully manage remote site equipment from centralized locations thus greatly reducing the need for site visits.

InSite Connect provides centralized notification of remote site alarms and equipment status as well as configuration and maintenance of remote site equipment. InSite Connect is a remote site control and monitoring solution that:

- Remotely controls and protects the network
- Tracks and measures site performance for peak operation
- Identifies root causes of performance problems with speed and precision
- Enables efficient, maintenance actions in case of site failures or breakdowns

The OneBase InSite Connect system is comprised of two primary components: the Central Management System (CMS) and the Remote Controller Units (RCU).

Central Management System

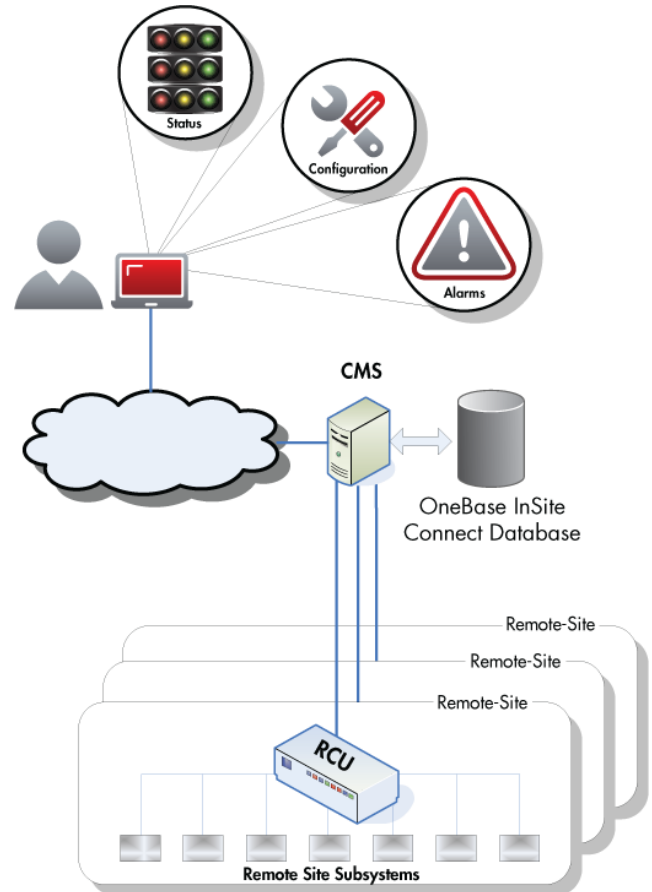
The CMS server is centrally installed in an operator's core network and is designed to communicate with the RCU at sites. The CMS server is capable of managing up to 2000 sites. If more than 2000 remote sites need to be managed, then multiple CMS servers can be deployed. Furthermore, these servers are capable of being interconnected to perform like a single virtual server.

The CMS is not only capable of real-time remote site monitoring of equipment status, and alarming, but also is capable of scheduling site specific changes on either a one-time or a regular recurring schedule.

In addition, the CMS is capable of generating reports that summarize the site specific data that is constantly being gathered by the RCU units at each site.

Remote Controller Unit

The RCU is the central aggregation point at each site and provides the connectivity and control to manage all site operational subsystems. By design, all remote access to the site subsystems via the RCU



is tightly controlled and is only possible through the centrally located Central Management System (CMS).



The RCU is a 1RU 19" rack-mountable unit with a total of 88 ports available for connectivity to local site subsystems. These ports include:

- 43 Dry contact ports (Monitoring Open/Closed conditions)
- 16 Analog ports (8 voltage and 8 current)
- 6 Form C Relay ports (Controlling remote site subsystems)
- 5 General purpose 10/100 Base-T Ethernet ports
- 11 General purpose serial ports (5 RS-232; 2 either RS-232 or RS-485; 4 RS-485)
- 2 USB 2.0 ports

Some sample site subsystems that can be monitored and/or managed include:

- | | |
|---------------------------------|---------------------------|
| • AC Power Transfer Switches | • SCPA/MCPA |
| • Battery Discharge | • Microwave |
| • Battery Monitors | • Power Fail |
| • Door entry control and alarms | • RET Antenna Controllers |
| • Fire/Smoke detectors | • Temperature |
| • Fuel Cell | • Thermostats |
| • Generators | • TMA |
| • Humidity Sensors | • Tower Light |
| • Hydrogen Detectors | • Water Intrusion |
| | • Cameras |

Cost Benefit Analysis

Solution Benefits

Site Visit Expense Reduction

The InSite Connect solution offers centralized management of remote site equipment.

This centralized management provides for the measurement of site equipment performance, identification of site problems, and in some cases, site problem resolution without the requirement for expensive site visits thereby reducing OpEx.

Even for those cases when a site visit is still required to resolve a problem, remote access prior to the visit can help identify the actual problem and ensure that a single visit is all that is required. This reduces the expense of a preliminary site visit to identify the problem and a second return visit with the correct spares, equipment, or tools.

InSite Connect keeps complete detailed logs of every measurement, alarm, and configuration action performed at every site. This not only facilitates management of technician activities, but also provides for easy reporting on requirements such as historical battery backup power capabilities.

Energy Related Expense Reduction

Often, when visiting a site, a technician may change the temperature settings by many degrees to make it more comfortable to work. This can add significant cost if not returned to the previous temperature setting when the technician leaves. When paired with site remote-controllable thermostats, InSite Connect can identify these expensive conditions and can reset the temperature back to the standard setting.

Crime Related Expense Reduction

Criminal activities, such as theft and vandalism continue to be a problem particularly at remote sites. InSite Connect brings onsite IP cameras as well as motion detectors and door access control systems into play to help in crime deterrence as well as criminal detention, apprehension and prosecution.

An associated benefit of InSite Connect is the ability to remotely monitor site access. For critical sites, an IP remote camera could be used as a visual verification before remotely unlocking a door. Additionally, once a door alarm is noticed, remote cameras can be used to check for signs of unauthorized entry, theft, or vandalism.

“Soft” Alarm Benefits

InSite Connect provides the ability to establish flexible threshold “soft” alarms where the alarm measurement points can be remotely set (and then easily modified) to identify marginal conditions before they become critical problems. For example, these alarms can be used to give early warnings for upcoming HVAC issues when internal temperatures just start to move outside of optimal ranges but before the HVAC system is incapable of maintaining temperatures within critical temperature points.

Another example use of InSite Connect alarms is to identify when the amount of fuel in the site generator reaches predetermined levels. This would eliminate the expenses associated with unnecessary trips to the site to replenish the generator fuel when it is not yet needed or service down periods due to insufficient fuel.

Quality Related Churn Reduction

The early detection of impending problems before they become critical will have a substantial effect on the reduction of subscriber perceived quality problems that result from reduced site performance. Although it is difficult to quantify, this avoidance of quality issues will have a positive effect on churn.

Consolidated Site Management

InSite Connect is centralized and diversified; hence, it offers the advantage of removing the costs associated with managing multiple systems. Rather than having separate systems to manage dry contact alarms, temperature control, power management, etc, InSite Connect facilitates the management of all of these systems. This consolidated management will not only reduce software and hardware costs but will also increase reliability, maintainability, and efficiency while reducing learning curve costs.

Tangible Benefits Summary

The primary financial benefit of the InSite Connect solution is the reduction of OpEx as related to remote site operations. These expense reductions are:

- Reduction of wasted energy usage as related to temperature control
- Reduction of the number of technician or other maintenance related site visits
- Reduced expenses due to inefficient repeat technician site visits
- Reduced criminal theft and vandalism related expenses

Green Benefits Summary

The ability of the InSite Connect solution to reduce site visits, manage BTS building temperatures, and avoid costly dispatches of emergency repair crews, not only reduces yearly OpEx, it has a very direct impact on your company's carbon footprint and preservation of the environment.

Site visits require fuel. The more trips taken, the more fuel burned, which translates to more CO₂ produced by your company and a larger carbon footprint. Table 1 below, provides a typical example of potential carbon output in a year.

MPG	15
Avg. miles to site	15
Number of sites in market	30
Times visited per year	24
Price of Gas	\$2.80
Number of trucks in fleet	5
Miles Driven	54,000
Gallons of fuel used	3,600
Cost of fuel	\$10,080
Pounds of CO ₂ produced per year	72,000
Tons of CO ₂ produced per year	36

Table 1: CO₂ Yearly Output

The InSite Connect solution serves as a green partner, helping your company preserve and improve the environment while reducing your operating costs.

Intangible Benefits Summary

There are other direct benefits of the InSite Connect solution that are difficult to quantify financially. None the less, these are real benefits to the operator. These intangible benefits are:

- Identification of impending equipment problems or marginally effective equipment before critical problems arise
- Detailed history log of every measurement, alarm, and configuration action performed at every site. This capability provides for:
 - Better management of specific technician labor and accountability
 - Reporting on requirements such as historical battery backup power capabilities
- Better control of site access
- Reduced loss of airtime and churn due to avoidance of quality issues and reduced downtime
- Reduced costs and training requirements due to consolidated management of diverse site systems